Montana Bicyclist Training Program

This research based program is designed to train elementary students (age eight through 12) in the riding skills, hazard identification and traffic analysis necessary for safe and efficient bicycling. It was developed in Missoula, MT in 1980.

*Asterisk denotes lessons taught on bicycle

Edited by: Roger and Sharon DiBrito, 1980

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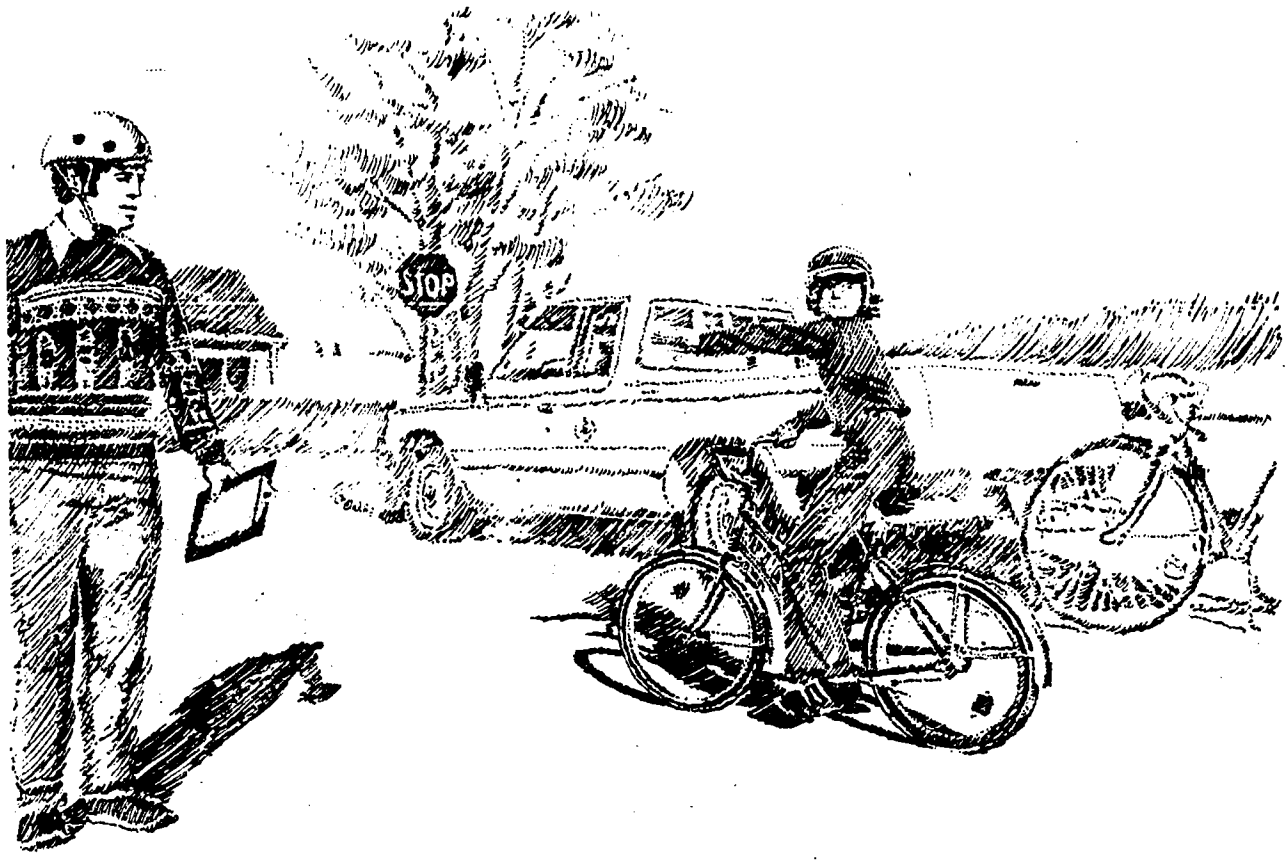
ABSTRACT

This guide is designed to train elementary students in the riding skills, hazard identification, and traffic analysis necessary for safe bicycling under nearly all urban traffic and roadway conditions. The training manual is divided into four sections. The Instructor's Manual presents brief introductions, background information, and detailed explanations of activities for each of the fifteen lessons on: bicycle sizing and equipment check; traffic mix; hazard identification; stopping; reaction time; rock dodging; emergency turns; scanning to the rear; traffic flow; driveways; residential intersections; high traffic intersections; route selection; controlled environment scanning; and tour of the neighborhood. The Curriculum Guide consists of brief summaries of the objectives, activities, and equipment for each lesson. The third section consists of scripts of audiovisual presentations to accompany several lessons. Appendices in the fourth section include a sample student journal for the lessons, an inspection list, a model bicycle ordinance code, and ordering information for books and films. (CJ)



MONTANA BICYCLIST TRAINING PROGRAM

Office of Public Instruction
Helena, Montana 59601

Prepared with funds provided by the
Montana Department of Community Affairs
Highway Traffic Safety Division
State Capital
Helena, Montana 59601

Edited by: Roger and Sharon DiBrito
Montana Bicyclist Training Center

FOREWORD

Bicycling is booming! Bicycles don't consume energy, don't pollute, don't take a great deal of space, and provide tremendous opportunities for individual and family fitness and recreation. This growth in the popularity of bicycling, although it has many excellent ramifications, creates traffic safety problems. Recent studies have shown that 60% of bicycle/car accidents occurred among bicyclists between the ages of eight and twelve. Many of these accidents resulted in the cyclist's failure to use proper riding techniques in hazardous situations. In an effort to help eliminate some of these accidents, we have developed the *Montana Bicyclist Training Program*. It is now ready for adoption statewide. I am pleased to make this program available to you and I wish you every success in its implementation.

Should you need assistance, let us know.

ED ARGENBRIGHT
State Superintendent

PROGRAM OVERVIEW

In 1979, the Montana Department of Community Affairs, Highway Traffic Safety Division, funded the City of Missoula to develop a bicycle safety program. This is one of several community projects helping improve bicycling behavior and traffic flow in the Missoula Valley. Following six months of research, writing and preliminary testing, the curriculum was completed and presented to the Missoula School District #1 Board.

In the Autumn of 1979, the School Board and Administration gave full sanction and approval for implementation and evaluation of the program in all Missoula elementary schools (fourth grade). The program was taught by teams of physical education instructors, Missoula's bicycle coordinator, a local bicycling consultant, and fourth grade classroom instructors. A total of 700 fourth graders received instruction in this pilot program. Roger DiBrito, curriculum specialist who designed this program, took special leave of absence to work full-time overseeing this project's implementation during April and May, 1980.

This program is unique in its incorporation of the following elements:

- On-bike training which teaches basic handling skills identified as important in accident avoidance.
- Perception skills and hazard recognition are taught in the classroom.
- The program is adaptable. Individual schools can elect to teach 6, 12 or 20 hours. Each program option was tested to determine cost benefits. (Walkenbach-Hewitt Final Report, 1980)
- All physical education instructors received 20 hours of instruction, and are certified to teach these basic skills. Instructors have the option of receiving two college credits for their work.
- AV programming has been packaged for ease in teaching classroom sessions.
- An extensive literature search and field research allow us to incorporate all of the latest principles and findings in bicycle safety education.
- Accident causation principles are covered in the classroom.
- Instruction is positive, and focuses on bicycling as a wholesome, enjoyable lifetime activity.
- The training program is part of a larger community effort to encourage mature riding practices.

In January, 1980, the Montana Department of Community Affairs, Highway Traffic Safety Division, funded the second phase of this project: the implementation, evaluation and fine tuning of the program. An independent research team designed and administered a thorough evaluation of the teacher training program, cognitive knowledge, bike handling skills, and teacher satisfaction with the program. The evaluation provides analysis of all activities with the objective of program improvement. The effectiveness, adequacy, efficiency and improvement of the program are presented.

In the Spring of 1981 the Montana Department of Community Affairs, funded the Office of Public Instruction to administer the program statewide as the Montana Bicyclist Training Program. The Office of Public Instruction contracted with the Montana Bicyclist Training Center to conduct teacher training workshops and monitor all phases of the Montana Bicyclist Training Program.

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Introduction

This program is designed to train elementary students (age eight through 12) in the riding skills, hazard identification and traffic analysis necessary for safe and efficient bicycling under nearly all urban traffic and roadway conditions.

In his landmark study, "Bicycle-Safety Education —Facts and Issues" (1978), Dr. Kenneth Cross found that more than 60% of the bike/car accidents in the United States occur among bicyclists between the ages of eight and twelve. Many of these accidents resulted from the bicyclist's failure to use proper riding technique in a hazardous situation. Indeed, one may speculate on the ability of nine-year-olds to recognize a hazardous situation involving other traffic, since they really have no training at all in what constitutes normal traffic flow. Children of this age group aren't trained drivers, yet we turn them loose on the streets with bicycles, and expect them to blend in safely with motorized traffic.

This program is based on several assumptions. The first is that there are proven emergency maneuvers available to the bicyclist should he suddenly find himself in a dangerous situation. These maneuvers include dodging, emergency turns, emergency stops, as well as such basic defensive riding techniques as scanning to the rear for approaching traffic. These are *skills* which must be learned, skills that enable the bicyclist to deal with hazardous situations *without losing control of the bicycle*, without creating another, perhaps more dangerous incident.

Although emergency maneuvers and defensive riding skills are fundamental to safe riding, they are by and large learned skills, and instruction in them is central to this program. That brings us to assumption number two: You can't teach safe bicycling effectively without getting onto bicycles. Therefore, nearly half of this curriculum must be taught outside on bikes.

Finally, it seems obvious that we can't expect children to ride safely in traffic without showing them how traffic works. We've acted upon this assumption in several ways, including lessons on accident analysis, traffic flow, placement of the bicycle in traffic flow, and the traffic law. The guiding principle here is: *If the bicyclist wants to avoid an accident with a car, he must learn to be where drivers expect him to be,* doing what drivers expect him to do.

Since this curriculum involves the use of bicycles, several guidelines may be helpful.

- Get in touch with your local Police Department before the program gets going. Many of the lessons depend on the teaching of bicycle ordinances. These vary from city to city. The lessons in this program are built around Model Bicycle ordinances. These are fairly standard, yet your specific situation may require slight changes to some of the lessons. You can't know this without checking. Also, your local Police may be willing to give you valuable help in conducting the program.
- In some cases, the teacher may find it useful to invite an expert bicyclist to demonstrate emergency maneuvers to the class. Naturally, this point is dependent upon the teacher's preference, and the availability of a qualified cyclist. Should you desire such assistance, local bike clubs, dealers, or police departments may be able to put you in touch with someone willing and qualified to help.
- Two of the lessons (11 and 15) require riding off the school yard and onto public streets. These rides require some groundwork. First, you should secure parental consent. If you elect to do this, make it easier on yourself and get consent for both rides at the same time. It is not recommended to ride in groups of more than eight. This point is a matter of teaching effectiveness and safety. Your class will probably be larger than eight students, so plan to break the class into groups and lead them at different times. Or, try to find some volunteers to lead groups.
- During the on-bike lessons outside, if your students aren't engaged in a riding exercise, have them park their bikes away from where you're trying to conduct class. *Good behavior and attention are usually made possible by the removal of temptation*, especially when you're nine and it's a warm, bright day in spring.
- Above all, remember that safe bicycling and fun bicycling should be compatible. The motor ability that allows a student to do numerous "hot dog" maneuvers also enables him to master emergency turns, stops and dodges.

Course Materials

1. Instructor Manual

The instructor manual gives the reader a brief introduction to each lesson. It provides background information and detailed explanation of the suggested activities.

2. Curriculum Guide

This booklet consists of a brief summary of the objectives and activities and equipment for each lesson.

3. Audio-Visual Material

Many of the lessons require audio-visual packets, which are included with the curriculum package. These packets consist of ordered slides and a script.

One film, "It's Your Move," is included as part of one lesson. Another, "There's Only One Road," is recommended for use at your discretion. Both of these films are available through the Montana State Audiovisual Library (See Appendix D.)

4. Appendices

The appendices consist of four sections:

A. Student Journal

One blank page for each of the 15 lessons. These pages can be used for notes, and, ideally, diagramming traffic. For these diagrams, bare, drawn intersections are very helpful. Also, the instructor can use these journal pages as an evaluating tool.

B. Inspector List

The inspector list and form were derived from the Bicycle Manufacturers Association of America Model Inspection Form. The inspection list is suitable for copying.

C. Model Bicycle Ordinance

These are suggested traffic regulations from sections of the Uniform Vehicle Code and Model Traffic Ordinance and that contain special provisions applicable to bicycles and other vehicles moved by human power.

D. More Information

If you would like to make a more extensive study of bicycling, or get more information about the Montana bicyclist Training Program, names and addresses are provided here.

5. Bicycles

The use of bicycles presents two essential problems. First, every student should have a bicycle. In the event that this is not possible, every other student should have a bicycle and then trade off. Ideally, bicycles will be provided for those without by the sponsoring agency, whether through purchase or donation by local civic groups or merchants. Inevitably, several students will not own a bike. However, this problem may be overcome quite easily by borrowing a bicycle from a friend, relative or local bike dealer. Most law enforcement agencies have an inventory of unclaimed stolen bicycles upon which you may be able to draw.

Bicycles must also be in good mechanical condition and proper adjustment. It is the responsibility of the parents to register the bicycle and keep it in good operating condition.

6. City Map or Neighborhood Map

If you don't include a map in the Student Journal, you'll find a large city or neighborhood map necessary in the later lessons.

7. Miscellaneous Equipment

The early riding exercises require these pieces of equipment.

- Tools. Assorted wrenches, tire pump and grease rag, first aid kit.
- Sponges. To be used to simulate rocks in the dodging drills and stopping exercises.
- 100' Lane. This facility can be made of masking tape on a large paved surface. The lane is used to give riders practice in making maneuvers within a limited space, as they must do in traffic.
- Traffic cones. These cones are used to define a practice area.
- Illustrated Cards. These cards should be about eight inches by ten inches. Each card should be decorated with a large number, color, or other graphic, and bound in bundles of four.
- Model Traffic Signs. This is an optional item, but one which may be useful at varying points in the program.

If you'd like to make a more extensive study of bicycling, these books are highly recommended:

Effective Cycling, by John Forester, available from Custom Cycle Fitments, 782 Allen Court, Palo Alto, California 94303.

Bicycle-Safety Education — Facts and Issues, by Kenneth D. Cross, Ph.D., published by AAA Foundation for Traffic Safety, 8111 Gatehouse Road, Falls Church, Virginia 22042.

Evaluation

Each lesson includes several suggested means of evaluating the student's progress throughout the course. These are noted specifically in the **CURRICULUM GUIDE,** and consist of the student's performance on a bicycle, his participation in group discussions, and an evaluation of his Student Journal entries.

A Final Note

The students you teach were probably riding bikes before they set foot in your class and, we hope, they'll continue to ride for the rest of their lives. Right now, they're at a point in their riding at which they can most easily form safe habits that will serve them well for years to come. Not only will this course make them safer bicyclists, but it should make them safer drivers as well.

All too often in the past, bicycle programs were designed to evoke fear in the bicyclist. The Montana Bicyclist Training Program is designed to teach skills and knowledge to allow the bicyclist greater *safety and confidence.* A positive attitude on your part IS as important as the information you share.

Lesson #1

Bicycle Sizing and Equipment Check

Introduction

Both proper adjustment of the bicycle seat and handle-bars, and selection of the proper frame size for the person riding the bike are imperative to safe bicycling. It is equally important that the bike be maintained in good mechanical condition. Improper adjustment and size, or faulty equipment, can severely impair the rider's ability to control the bicycle. Lesson One is intended to enable the student to adjust his handlebars and seat to their proper height, to insure that he is riding a bicycle that is the correct size, and to acquaint him fully with the equipment on his bicycle, and any repairs that should be made.

Your ability to make repairs during the lesson is severely limited. You are not expected to be an expert bicycle mechanic in order to teach the lesson, and neither are your students. However, the student must learn to recognize for himself any mechanical problems with his bicycle. If time allows, each bicycle is to be given a detailed check (under your supervision). Indeed, some bikes may require maintenance on such items as brakes, tires, spokes or chains, which must be completed before the student is allowed to use that bicycle in future lessons. Here are some guidelines to help you determine if a bicycle is in good working order:

- Do the brakes, when applied, hold the tire(s) firmly, so that they skid when the bike is dragged over dry pavement? If not, the brakes are not safe.
- Are there loose or broken spokes? Damaged spokes may puncture a tire, become entangled and cause damage to other parts of the bike, or if several spokes are missing from the same area, the wheel may collapse.
- Does the chain appear too loose? If so, it will slip off the sprocket and may cause loss of control.
- Do the wheels turn freely?
- Is there sufficient air in the tires?
- Are there any cracks in the frame, or bad bends? Note especially the joints where one part of the frame is brazed to another. This kind of damage must be repaired by a professional.

If you feel confident in your ability to make any repairs during the lesson, by all means do so. However, there are two points worth remembering. If you do make repairs, use that activity as a learning experience for the students. Also, bike repairs can be very time consuming, especially when 15 or 20 bikes—and their owners—are involved. *On the spot maintenance is not an objective of this lesson.* Your only responsibility here is to note needed repairs, not make them.

As you proceed through these activities, remember that for a student to become responsible for the condition and adjustment of his bicycle, he must understand the bike. This lesson, then, must emphasize an active discussion of why size and adjustment are important (improper fit leads to loss of control while riding), how the various parts of the bicycle work, and how failure of those parts to work properly endangers the cyclist through loss of control.

Activities

1. Adjustment

While you are not expected to make repairs to the students' bicycles, a brief check and any necessary adjustment of each student's seat and handle-bar height is in order. For these adjustments, you will need a six inch adjustable wrench, a screwdriver, and an aide.

During this activity, have each student check the size of his frame. In some instances, a bicycle may be obviously too large for its rider. More specifically, if the student has a boy's (diamond) frame, the student's crotch must be at least one inch above the crossbar when straddling the bicycle with both feet flat on the ground. Of course, if a student's bike is too big, there isn't a great deal you can do. You may want to prohibit him from using that particular bike in the program, but this doesn't seem worthwhile, since the student is riding the bike anyway. But a word of caution is in order in cases such as this.

- **Seat:** When sitting on the seat, the rider's leg should be almost fully extended as his heel is placed on the pedal with the pedal at the bottom of its cycle.
- **Handlebars:** Have the student place his elbow on the tip of the seat and extend his arm forward. His fingers should just reach the handlebars at the point where they are clamped in the stem. Note: If the student has high-rise handlebars, it is extremely important to his ability to control the bike that his hands do not ride higher than his shoulders.

2. Bicycle Equipment Check

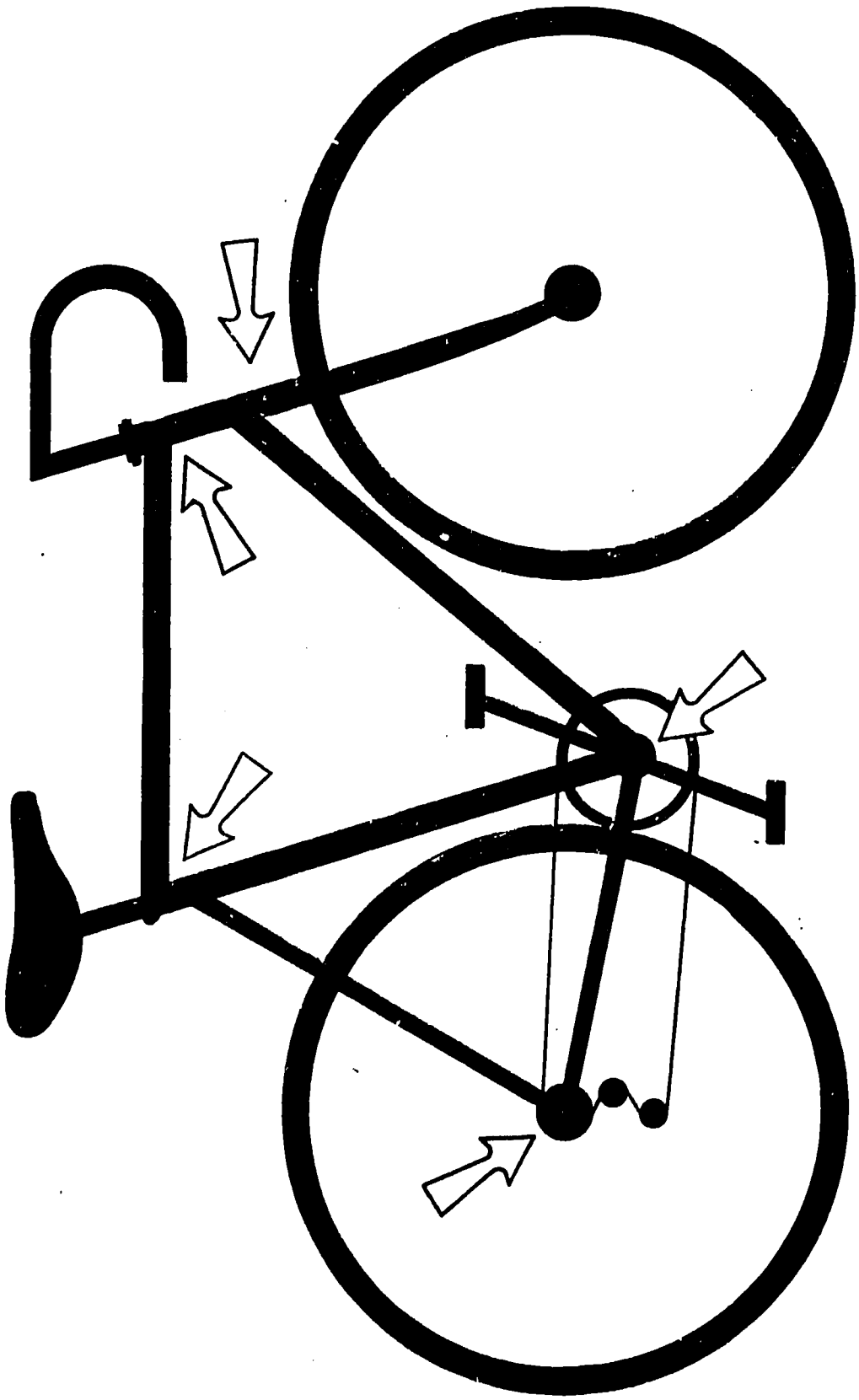
Discuss the importance of a well-maintained bicycle, and go over the items on the safety checklist. If time allows, have each student check *his partner's* bicycle. This is important since the students will be familiar with their own bikes and may tend to overlook maintenance problems.

Remember, now is not the time to make repairs. If you feel a bike needs work before the student continues to use it in class, note the work required on the checklist. As an optional activity, you may want to arrange with the PTA, Scouts, or other group to have a special repair session. If anyone seems interested in doing his own work, you might suggest buying **Richard's Bicycle Book**, or **Anybody's Bike Book.** These are both comprehensive, easily understood maintenance guides, which are available in most bookstores or bike shops.

Register the Bicycle

The registration of the bicycle should be done at home by the parents.

Besides acting as a deterrent to theft, registering bicycles is an excellent way to get students to stand back and take a fresh look at their bikes. Check with local law enforcement agencies to determine if there is any organized registration program in your city. If the bicycle is stolen, all facts such as serial number, color, brand, size, gearing and accessories will aid the owner in identifying his bike to the police. Figure One is a guide to help you locate where the serial number is stamped on the frame of nearly any brand of bicycle.



Common locations of serial numbers
Figure 1

Lesson #2

Traffic Mix

Introduction

This lesson employs the guided discovery technique to teach spatial relationships. Since young bicyclists have had little experience in closely controlled traffic situations, they often have only the thinnest conception of how they *and their bicycles* fit into a system of group movement. Yet most students have had considerable experience with moving as individuals in organized situations, such as routine movement around the school as a class. Lesson Two bridges the gap between the student's familiar experience with moving as an individual, and the new space requirements of movement as a unit with his bicycle.

Lesson Two also has two other important functions. The group movement that takes place in Activity One requires that the student be particularly alert to the actions of others as they move around him. He must *look* in all directions if he is to avoid a collision. The eye, head and shoulder movement used here is the first step in learning the skill and habit of scanning to the rear for traffic. This lesson also produces activity *by the students,* which may be used through group discussion as an introduction to traffic flow.

Activities

1. Traffic Mix in a Defined Area

This activity is conducted in a large open space. Use eight or ten traffic cones to establish boundaries about 25 paces by 25 paces. However, if you have fewer than 20 bicyclists in the class who will use the area at one time, the size of the area should be reduced.

The object of this activity is for the students to move freely about without touching each other or leaving the activity area. Although the students first will be walking, the Activities end with them riding their bicycles. Therefore, it is important for you to establish firmly both visual and auditory stop signals. The student must react quickly to those signals. Only in this way can you keep the chance of a crash to an absolute minimum.

In this and following Activities the students will tend to organize themselves into a circular "lapping" pattern around the perimeter of the area. This will increase as the students move faster, and will become most pronounced when they're riding. *Break up the lapping pattern.* Although the students' tendency to organize their movement is a valuable item for discussion in Activity Two, it is important that the students be kept moving at random at this point. Remind them frequently of the need to look in all directions as they ride. This is the first step in developing the skill and habit of scanning.

Now, have the students proceed as follows in the defined area:

- Walk throughout the general space without touching anyone.
- Run in the general space without touching anyone.
- Walk the bicycle in the general space without touching anyone or anything.
- Run with the bicycle in the area. No touching.
- Gather the students outside the area. Then, release them two or three at a time into the area. Introduction of the riders in this way decreases the chance of *collision.* After several moments, all the students should be riding in the area.
- Have the students ride faster, emphasizing scanning and control. At this point, you may also want to decrease the size of the area. This is a matter for your judgment. Remember, by now the activity should be difficult, though not impossible or dangerous.

2. Group Discussion

Here are some points you may want to bring out in group discussion at the end of Activity One:

- Emphasize the need for scanning, and how that need increases as movement becomes faster and more congested.
- Use of the bicycle places several demands on the student's skills that walking alone doesn't. The rider *and* bicycle take up more room than the rider alone. The bike moves faster and needs more time to stop. It is more difficult to control than the body alone. In short, *riding a bicycle requires more attention and control than walking or running.*
- Remind the students of how they tended to organize themselves into a lapping pattern. This may be the most basic and powerful illustration of the need and purpose underlying all traffic management. Why? Because drivers want to know what kind of movement they can expect from other vehicles in traffic. Such knowledge makes the road not only safer, but easier for everyone. The fact that students themselves tried unconsciously to organize their movements should indicate to them on the simplest level the importance of organized traffic flow. Once this point is made, it will prove highly useful to you in later lessons.

Lesson #3

Hazard Identification

Introduction

Not all dangerous bicycling situations result from the presence of other traffic. Scarcely anyone who has ridden a bicycle hasn't had close encounters—or actual contact—with such environmental hazards as broken glass, potholes, storm drains, or darkness. In fact, many car/bike accidents are the results of the bicyclist's attempt to avoid some other hazard on the roadway—attempts which are often poorly executed.

Lesson Three consists of an audio-visual review of hazards commonly found in the cycling environment, and a drill on those hazards, too. The Lesson concludes with review of local bicycling ordinances as they pertain to roadway hazards.

Activities

1. Hazard Review

Briefly identify any hazards specific to the neighborhood, such as new construction. Prior knowledge of existing hazards is a very important element in defensive riding.

2. A.V. Packet Three

Present A.V. Packet Three, which deals with hazard identification on several levels. Most apparent is the simple presentation of such basic hazards as potholes and roadway debris. However, dealing with hazards is often more complicated than just seeing a pothole and going around it. For instance, let's say a bicyclist encounters broken glass. Traffic is approaching from the rear. At the curb beside the broken glass, a driver is sitting behind the wheel of a parked car, and the car's brake lights are on. Just around the parked car, a truck is trying to enter the roadway from the parking lot of a gas station. Consider the hazards:

- *The parked car.* Will the driver pull out into traffic? Open his door? Back up? Do nothing?
- *The truck in the gas station.* Will this driver try to squeeze into traffic now, or wait until the bicycle and other vehicles are past? Does he even see the bicycle?
- *Traffic approaching from the rear.* How many vehicles are there? Will they slow up and wait for the bicyclist to pass the parked car and the glass? Will they even notice that the bicyclist has a problem with the glass? Perhaps someone will try to slip by the bicyclist and park behind the other car, or turn into the gas station. If so, will that driver signal his intention? Maybe. Will the bicyclist be in a position to see that signal? Maybe.
- *The broken glass.* It's still there and getting closer. What are you going to do?

As you can see, hazard identification and response can be a complicated matter. A.V. Packet 3 is designed to illustrate the problems raised by multiple hazards, and impress on the student the need to "ride ahead" and plan every move as carefully and completely as possible.

3. Bicycling Ordinances

Lesson #3 concludes with another brief review of bicycling ordinances, again emphasizing the way in which ordinances formalize traffic flow and create predictable behavior by all kinds of vehicles sharing the road. Remember: Traffic ordinances enhance safe riding because they place the bicyclist where others expect him to be, doing what others expect him to do.

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Lesson #4

Stopping

Introduction

Lesson Four is designed to teach the student proper stopping technique, and introduce him to the variables in stopping time and distance.

Young bicyclists face three fundamental problems when stopping the bike in an emergency situation. They have no technical knowledge of how controlled friction causes the bicycle to stop, so their immediate reaction is to slam on the brakes as hard as possible and hope for the best. This problem is one of rider skill. And, since fourth graders do not drive cars, they have difficulty comprehending how far a car will travel in a given time at various speeds and under various conditions. Here, lack of experience makes for unclear decisions on exactly *when* a quick stop must be initiated. This problem is one of perception. Finally, you will notice once the students begin practicing, that great, long skid marks complete with screeching tires, flying debris and dramatic facial expressions are much more fun than precise, efficient maneuvers. This problem is one of human nature.

The stopping of any vehicle results from friction. With a bicycle, the primary sources of friction are the tire rubbing against the road, and the brake system, whether that be pad against rim (hand brakes), or shoe against drum (coaster brake). The dual action of tire *and* brake friction produces the safest and quickest stop.

The point at which a tire begins to skid varies according to quality and condition of the brakes, condition of the tire and road surface, and temperature. However, the most important point to remember when teaching this lesson is that riders must learn to judge conditions and stop without skidding.

With a skidding stop, the most immediate problem is that the rider no longer has control of the bicycle. Most often, a stop of this kind causes the bicycle to drift sideways, and may end with both rider and bicycle lying flat on the ground. And, because the rider is out of control, he is denied the option of making other maneuvers, maneuvers such as dodging, turning or accelerating, any of which may become critical to getting out of a dangerous situation.

Why is stopping efficiency lowered by a skid? Stopping results from tire and brake friction. However, when the wheels are locked up and a skid begins, the brakes are no longer generating friction. Although tire friction does increase in a skid, that increase is not great enough to compensate for the brake friction that is lost. So, the bicycle takes measurably longer to stop once the brakes are locked.

The relative stopping times and distances of other vehicles may be difficult for some students to grasp. Several of the activities in this lesson demonstrate the simple fact that stopping time and distance do vary, yet the student's judgment of variance can be sharpened only by experience. At this point in the course, the most important thing for the student to learn is that stopping variance is a factor which he must take into account all the time he's riding. The matter of judgment will be developed more fully in Lesson Five.

Activities

1. Demonstration of Proper Stopping Technique

Figure Two shows the riding position that results in the most effective weight distribution during a stop. Weight distribution is extremely important for several reasons. Since the rider and his bicycle are two separate objects, the rider's weight is thrown forward during a stop. In extreme conditions, the rider can somersault over the handlebars. Also, as the forward transfer of rider weight takes place, that weight is lifted from the rear tire, which results in less friction at that point, less stopping power. Finally, the less weight there is on the rear tire, the less brake force one needs to send the bike into a skid and out of control.

Notice how the rider in Figure Two has moved into an exaggerated position far back on the seat. This is deliberate, a simple technique to keep as much weight on the rear wheel of the bicycle as possible. This is the

cornerstone of all safe, quick stops. Notice, too, that the rider's shoulders are dropped very low, and his elbows are bent. These are secondary characteristics that result from shifting weight to the rear, and aid the rider in staying there.

The technique shown in Figure Two should be demonstrated to the students. If you want to demonstrate it yourself, yet aren't familiar with the maneuver, *practice first.* Even the most skilled cyclist can take a spill at times if he's out of practice. Or, it may work best for you to enlist the help of a proficient cyclist to carry out the demonstration. In any case, it's often helpful to have an assistant during this and other riding demonstrations, since there's some difficulty in talking while you demonstrate. The maneuvers take place very quickly, and a helper on the ground will usually make the demonstration more clear. The use of a helmet is recommended, when available.

2. Student Practice

Give all the students a small kitchen sponge, then send them out into a large practice area on their bikes. Each student should use his sponge as a cue to stop. Instruct the students to ride at slow speeds toward their sponges. The object is to stop as close as possible to the sponge *without skidding.*

Let the students work at their own pace so that they will gain both skill and self-confidence. Move through the area giving tips as they are needed. Caution riders to stop without skidding. Skids will become more of a problem toward the end of this activity as students become more expert at good stops and the urge for adventure takes over. **Do not allow students to practice at high speeds!**

3. Controlled Practice

Gather the students at one end of the practice area and divide them into four or five groups. Have them ride toward you, one person from each group, abreast. On a visual or verbal command from you, the students will stop. This activity is designed to show the students how well they stop relative to others in their group, in addition to giving them further practice. Therefore, it's best to designate the bicyclists in one group as pacers, and instruct the others to ride abreast of the pace rider.

4. Practice at Various Speeds

This activity is similar to activity three. However, this time instruct the group you have selected as pacers to ride at five, eight, or ten miles per hour. In this way you can pick up the pace and tax the students' skills, as well as show them that higher speed requires more time to stop.

Each bicycle rider will need a partner to record his stopping distance. The recorder should stand in the stopping area armed with a stick of chalk. The recorder will mark on the pavement the location of the front wheel when the stop sign is given, and again at the front wheel when the bicycle comes to a complete stop. The measurement may be taken by stepping off the distance. You may want to record the student's stopping distance for future reference.

5. Restricted Area Practice

This activity requires a lane approximately six inches × 100', kitchen sponges and cardboard obstacles. The purpose here is to give the students experience in stopping abruptly when surprised, and stopping within a narrow space, similar to that found on the street when a rider is enclosed between traffic on the left, and parked cars on the curb on the right.

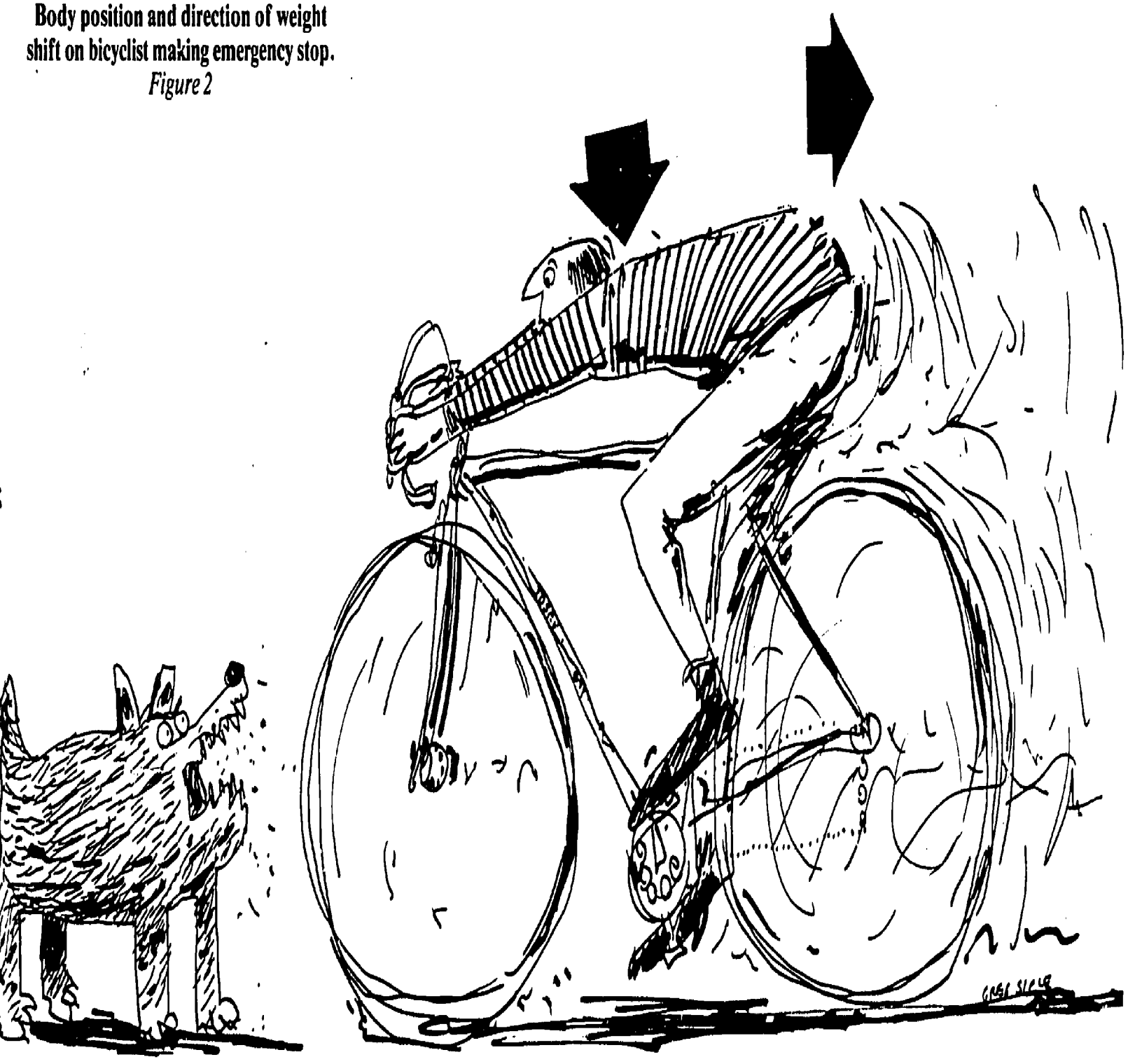
As the students ride individually down the lane, they will have to stop on one or more of the following cues:

- Verbal or visual signal by you.
- A sponge suddenly dropped in the rider's path.
- A cardboard obstacle held into the rider's path.

It's important that anyone you enlist to drop sponges or work the obstacles has a good understanding of how quickly the rider should be able to stop, so that the activity is difficult, but not impossible. Also, emphasize the importance of *stopping within the lane.* It does no good to stop for a hazard if the act of stopping throws the rider into even greater danger, such as the path of a car approaching from the rear.

Body position and direction of weight shift on bicyclist making emergency stop.

Figure 2



Lesson #5

Reaction Time

Introduction

Now that the student is able to stop the bicycle properly, he must explore further the use of that skill in traffic. It isn't enough simply to know how to stop a bicycle. Once the rider enters traffic, knowing when a good, quick stop is necessary becomes critical. Once this knowledge is developed, stopping becomes not only an emergency maneuver, but part of the rider's arsenal of defensive driving skills.

As was pointed out in Lesson Four the student's inexperience with motor vehicles is an important factor here. Obviously, this inexperience can't be overcome by turning the class loose on a busy street and letting them learn about stopping time and distance by listening to cars come screeching toward them. And, at the other exteme, a great deal of the technical data on this problem is too complicated for anyone but a research engineer to comprehend.

Lesson Five offers the combined use of a slide presentation, simple reaction time drills, group discussion, and, if available, the BART timing device. With these tools, you can familiarize your students with the relative stopping distances and times of various vehicles, and show them how effective stopping is an integral part of their complete system of defensive driving.

Activities

1. Group Discussion

Discuss briefly the students' stopping experiences in Lesson four. The key question for bridging those experiences into this lesson is: How does the rider decide when he must stop?

2. Audio-Visual Presentation

A.V. Packet Five illustrates the different stopping times of cars, trucks, heavy trucks, trains and bicycles. A short written description of each slide accompanies these materials, and will assist you in their presentation. As the slides are shown, students may record the stopping times and distances illustrated by each slide in their journals.

3. Reaction Time Drills

Any number of simple reaction time drills may be used here, so that students have an opportunity to test their reaction time against that of others, as well as to sharpen their reflexes. Two examples:

- Divide the students into pairs, and have each student face his partner. *A* holds both arms out, palms up, while *B* holds his palms down directly above *A*'s. *A* then attempts to slap *B*'s hands, while *B* tries to move his hands quickly enough to avoid the slap.
- Again, have each student face his partner. *A* then hold his hands up, with the palms about 4 inches apart. *B* holds one or both hands between *A*'s palms, and must remove his hand(s) before *A* can clap closed on them.

4. BART

BART is a device composed of bicycle handlebars and brake levers. The brake levers are connected to a timing device, rather than to actual brakes. If this device is available, it will be very advantageous to your students.

Position the BART in front of a movie screen. Then, using the slides from A.V. Packet Five, Supplement A, flash images on the screen. The timing device begins when the image appears, and stops when the student has "braked" the BART to a stop. However, not all slides in the supplement illustrate things that the rider must stop for. Note that reaction times improve with practice.

Use of the BART gives each student the chance to document his individual reaction time, and demonstrates that his reflexes, his defensive driving skill, can be sharpened with practice.

Lesson #6

Rock Dodging

Introduction

A great many bicycling accidents result from a wide, unexpected swerve to the left into the path of another vehicle approaching from the rear. Often, these accidents are the grim products of well-intentioned, even necessary maneuvers by riders, yet maneuvers that were improperly executed.

One need not be a bicyclist very long before realizing that two of the most immediate hazards the rider faces are debris on the road surface, and potholes.

The intent of good dodging technique is to miss a hazard on the road surface in as little time and space as possible. Missing a large rock by one inch is much safer and more effective in an emergency than trying to make a giant swerve to miss it by six feet. A rider always has an inch to spare, but that six foot swerve may take him into the curb, or worse, into the path of another vehicle.

The problem with a normal, leaning turn in an emergency is that it takes more time and room than the rider has. Emergency situations demand emergency maneuvers.

When the rider sees a hazard directly in his path, his immediate reaction is to jerk the handlebars in one direction or another away from the object. This is exactly what he should do. However, there are several important consequences of this movement, which he must deal with.

Let's say the rider jerks the front wheel to the right to avoid a rock. Although he may successfully get past the rock, the centrifugal force of "steering" sharply to the right actually throws his body weight to the left, pulling the bicycle in that direction.

To make a successful and safe dodge, the rider must snap the handlebars in one direction and instantly snap them to the opposite side. This second movement actually puts the bicycle back squarely under the rider, thus neutralizing the initial weight shift and stopping the turn before it begins.

If executed properly, this maneuver will cause the bicycle to deviate momemtarily from its path, miss the hazard and return to its original course in a matter of inches; and, if necessary, the maneuver can be done at very high speed. Remember though, that dodging takes place very quickly, so it's important that the rider not dodge until just before hitting the object. In fact, he may actually need to wait before dodging, or the bike may dodge, return to its path, and then strike the hazard.

On occasion, only the front wheel will miss the hazard and the back one strike it. Don't worry. Hitting a pothole with the rear wheel is uncomfortable, and may break a spoke, but it won't cause a crash. Control of the front wheel must be the rider's primary concern. Control of the front wheel means control of the bicycle.

Dodging requires practice. Since the rider's instinct is to jerk the front wheel away from the hazard, he must know the consequences of that action, and how to deal with them. Dodging is also important for students at this point in the program and in their lives. Emergency turns, the subject of a later lesson, are a simple extension of rock dodging.

Children seem to learn this maneuver faster than adults. This may be because they are less inhibited. They fall off their bikes more than adults do, so they aren't made as nervous by the sinking feeling that dodging can cause in the pit of one's stomach.

Activities

1. Balance

Discuss the role of balance in turning a bicycle. Most of them will catch on to this readily, since their experience supports what you're telling them. They just haven't heard turning explained precisely before.

2. Demonstration of Maneuver

As with the demonstration of stopping, you may wish to enlist the help of an accomplished cyclist. Or you may elect to demonstrate it yourself. Don't forget, though, that if you demonstrate this maneuver yourself, practice beforehand. Although rock dodging is fundamental to safe, defensive cycling, it can be a delicate maneuver, one which even experts find difficult at all but the slowest speeds if they don't stay sharp.

3. Student Practice

Again, give each of the students a sponge "rock" and release them in a large, open area. This Activity proceeds the same as the practice in Lesson Four, stopping only in this instance, the students will dodge the sponges in the manner demonstrated to them.

As the students become more proficient, encourage them to ride faster, to ride directly at the sponge, and not dodge until the last instant. Watch out, though, and don't let the speed get out of control, or you'll be having crashes all over the place between riders who are thinking about dodging their sponge, but not each other.

4. Line Formation Drill

Divide the class into three or four groups, and assemble them at one side of the practice area, as was done in Lesson Four, Activity Three. Extend a line of four or five sponges out ahead of each group. Then, one student from each group should proceed. so that the students ride abreast down the line of sponges, dodging each one.

This kind of organization will give you a chance to check each student closely, and the students can also measure their skill relative to others in the class.

5. Narrow Lane Drill

Place eight or ten sponges down a 100' lane. The students will ride down the lane, dodging each of the sponges while remainig inside the lane.

With this activity, you will find that many students feel it's most important that they miss all the sponges, and thus make a "perfect score." Therefore, they will tend to ride down the edge of the lane, make broad, weaving turns, anything to miss those sponges. The important thing, though, is not simply to miss the sponges, but to dodge them properly. So, you must constantly instruct the students to ride directly at each sponge and dodge it at the last instant.

6. Group Discussion

Discuss the students' experiences in the previous activities. Then follow that up with a discussion of the various hazards on the road surface which might necessitate a dodge. Encourage the students to be specific about the streets they ride on. After all, information is a large part of the foundation of defensive riding, and everybody in the class shares the same neighborhood streets.

During the discussion, you should emphasize several points. As with an emergency stop, dodging is used only as a last resort. By paying close attention to the road surface, the rider can usually spot hazards in time to make a smooth, planned maneuver around them. If people are riding in a group, it's good, courteous practice for each rider to call out **"ROCK"** and inform those behind him of a road surface hazard ahead.

Lesson #7

Emergency Turns

Introduction

On occasion, the bicyclist finds himself on a collision course with an object, such as a truck, which is too big to dodge. Situations of this kind require that the rider make an emergency turn.

The key to making a successful emergency turn is to shift one's weight as quickly as possible in the desired direction of the turn. This is best accomplished when the rider harnesses centrifugal force.

Emergency turns utilize the mechanics of weight distribution discussed in the introduction to Lesson Six. Remember: Turns result from leaning, from shifts in body weight to one side or the other, and when the front wheel is "steered" sharply to the left, the rider's weight is dumped in the opposite direction, thus pulling the bicycle right. With a dodge, the rider snaps the handlebars right to neutralize the weight shift. But in an emergency turn, the rider gives the bicycle its head, and follows the bicycle into a sharp, leaning turn to the right.

Emergency turns can be unnerving for even the most experienced rider, since they demand that he "steer" directly into the hazard in order to turn away from it. If a car is approaching from the left, the route of escape is right, yet the bicyclist must immediately turn his handlebars left toward the car in order to throw his weight into a sharp turn to the right away from the danger.

As with all emergency bicycling maneuvers, emergency turns require practice. Although this lesson utilizes only A.V. material and discussion, encourage your students to practice emergency turns—as well as other maneuvers—on their own. Since this maneuver is a variation of rock dodging, they should have little trouble picking it up on their own.

Activities

1. Audio-Visual Presentation

Present A.V. Packet Seven, which illustrates many situations in which an emergency turn is appropriate.

2. Group Discussion

Several avenues are open to you for discussion. The students will probably want to talk about exactly how the emergency turn works, since they won't be practicing it in this lesson. Also, you can encourage them to talk about their own riding experiences, about instances when they had need of an emergency turn. You can stimulate this kind of discussion by having them begin several days before the lesson to record such instances.

Finally, any discussion should center around the idea that good defensive riding removes the need to make emergency maneuvers, and, conversely, a solid grasp of emergency skills builds the rider's confidence to a point that he can devote greater attention riding defensively.

3. Film

The film "It's Your Move" is a good way to end this lesson. The film underscores the importance of defensive riding, which is heavily stressed in the following lessons. Until now, the students have been taught what to do when they find themselves in a cycling emergency. From this point on, the emphasis shifts to avoiding emergencies by neutralizing hazards. "It's Your Move" is an excellent transition. This film is available from the Montana Office of Public Instruction.

Lesson #8

Scanning to the Rear

Introduction

Until now, the program has centered around teaching bicyclists the fundamental emergency maneuvers—stopping, dodging and turning—vital to safe, effective cycling. Here, though, the emphasis is changed from emergency riding to defensive riding, to teaching the student to respond to, and even to control his cycling environment.

Perhaps no defensive riding skill and habit is both more important, yet more ignored than scanning to the rear for traffic. Part of the problem is undoubtedly due to the process by which children are most often taught bicycle safety. Consider the lessons in this program until now: In practically all instances, the students have been taught to look for and respond to hazards "out there" in the bicycle's path. So far, bicycling has been presented as a "straight ahead" activity. Unfortunately, many programs of instruction never reach beyond this limitation.

The Cross study points out that 12% of the fatalities occurred when the bicyclist made an unexpected swerve—for any number of reasons—into the path of a vehicle approaching from the rear. The problem is that bicyclists fail to look over their left shoulder as a matter of habit.

The teaching of scanning to the rear is one area in which the students' riding experiences will often work against you. Many experts are convinced that people don't scan to the rear because of those occasions when they tried to look over their shoulder, and the movement required to do that caused them to lose control of the bicycle. So, the risk involved in turning around is perceived to be greater than the risk of not knowing what's back there.

You can illustrate the cyclist's problem for yourself at your desk. Sit squarely in your chair, extend your arms ahead and lay your palms flat on the desk. Now, try to look directly over your left shoulder, all the while keeping your palms in *exactly* the same spot on the desk. As you can tell, scanning to the rear can be quite literally, a pain in the neck.

To mimic an effective scan to the rear, position your palms again on the desk top. Now, bend slightly at the waist, flex your elbows, throw your right shoulder slightly forward and . . . take a long steady look over your left shoulder. Simple! And note that your palms haven't moved, your "bicycle" hasn't wavered much at all from its course. Your neck doesn't feel like it's in a vise.

Activities

1. Stationary Scanning Drill

Divide the class into pairs. Partner A of each team will straddle the front wheel on B's bike and hold the handlebars steady. Now, B sits on his bicycle just as though he were riding it, and practices looking back over his left shoulder. Since the front wheel is held firmly in place, the rider must teach his body the proper movements for looking back. Many young bicyclists run into trouble when they try to scan without practice beforehand. The turning motion pulls the front wheel left and the rider ends up making a wide swerve out into traffic, into the very hazard he's trying to avoid. This exercise will help correct that problem.

As the students look back have them work at actually *seeing* what's there by describing to their partners what they see.

2. Scanning from a Moving Bicycle

Make up a set of display cards for each team. These cards should be about eight inches by ten inches, with three or four cards per set. The cards should be fastened together on one side so they can be attached to the handlebars of a bike and the rider can flip from one card to another. The cards can contain letters or symbols such as squares, triangles, circles, or just about anything you want.

Now, in a large open area, attach a set of cards to A's handlebars and send the class out riding. Each A will follow his partner—or any other B—and call out that person's name. When hearing his name, the bicyclist will turn, scan, and call out what's on the card of the rider who called his name. Emphasize that riders must make accurate identification without losing control of their bikes, or altering their path. The A riders should switch cards after each scan. As the riders become more skilled, they will be able to ride faster. Don't try to orgainze their riding, since letting them move at random increases the need for scanning, thus adding to the value of this Activity.

A word of caution: Changing the display cards is sometimes more difficult for students than scanning. So it's not a bad idea to allow students to jog or run behind scanning bicycle riders. Again, have the students switch roles.

3. Scanning in a Narrow Lane

This is a variation of Activity Two, using a 100' lane. Have Partner A follow B down the lane. A will call B's name, B will turn, scan, and identify the card. This can be done several times during each turn down the lane. Clearly, the intent of this Activity is to sharpen the student's ability to maintain a steady course by placing a "barrier" on each side.

After several turns, have the students switch roles.

4. Further Lane Drill

Issue a set of display cards to three or four student helpers and station them along the lane. Send the riders down the lane and drill them in the following ways:

- Scan and identify the card held up by each helper along the lane.
- Have the helpers call out riders' names. Each rider scans and identifies only the card held by the helper who called his name.

This is another of those activities in which some students will consider the "perfect score" more important than the practice derived from the drill. Don't let them fudge by sneaking looks at the cards as they ride by. You must control this exercise and let them look only as their names are called.

Lesson #9
Traffic Flow

Introduction

Imagine for a moment that you are a fourth grader standing at a curb, watching the cars go by. Where are all those people going? How will they get there? What rules do they follow? Who makes those rules? *What are all those cars going to do?*

As was noted earlier, the young bicyclist really doesn't know much about traffic, since he's not a trained driver. Yet he is expected both legally and for his own safety to negotiate situations that even experienced drivers may find difficult or dangerous. Clearly, your students must understand normal traffic flow if they are to proceed safely along public roadways.

This lesson employs an extensive audio-visual program, plus local traffic ordinances, to introduce the student to the way traffic works.

Although traffic flow is regulated by various ordinances and statutes, some of which apply specifically to bicycle use, it's very important for your students to understand the theory and necessity underlying traffic regulations. After all, blind compliance to some concept of The Law may be necessary at times, but it isn't a sound basis for effective teaching.

Think back for a moment to Lesson Two, Traffic Mix, in which the students moved at random in a defined area. Do you recall how it was necessary to keep them from falling into "laps?" Remember, too, how this tendency became more and more pronounced as the activity grew in speed and complexity. Remind the students of this before beginning the A.V. Program. Emphasize that traffic laws aren't designed arbitrarily to restrict freedom unnecessarily. Rather, they enhance standardized, *predictable* behavior in traffic situations which would otherwise be dangerous. *If a bicyclist wishes to be observed by drivers, he must be in a place where drivers are trained to look.*

Activities

1. A.V. Packet Nine

Present A.V. Packet Nine. This program illustrates road width and the general position of vehicles on the roadway. The importance of the bicyclist sharing the roadway with other vehicles, and proper positioning of the bicycle in a system of standardized traffic flow are emphasized. The crucial element of standardized flow for the bicyclist is *riding on the right with traffic, not on the left against traffic.*

One critical and often misunderstood or ignored point concerning the cyclist in traffic is the rider's basic position versus other vehicles. An astonishing number of bicyclists have the notion that they should ride on the left facing traffic. But riding on the left, head-on into traffic, is not only unsafe, it is illegal. *Ride on the Right* is introduced here as the basic principle of bicycle positioning on the roadway.

Obviously, there are situations, such as when making a left turn, or dodging debris, when riding to the far right margin of the roadway is not practicable. Traffic ordinances take this into account. In any event, *Ride on the Right* should not be confused with riding on the far right margin of the roadway. *Ride on the Right* concerns the direction of traffic flow, not lane positioning.

A.V. Packet Nine gives the students an opportunity to identify proper and improper bicycle positioning in a variety of traffic settings. The emphasis is on the decreased reaction time and stopping time available to both driver and bicyclist when wrong-way riding occurs.

3. Review of Bicycle Ordinances

By now your class should appreciate the necessity of standardized traffic flow. To support this appreciation, review any local bicycle ordinances governing on-road use. Appendix C contains the Model Bicycle ordinances. Your police department can supply you with any applicable ordinances in your city. In fact, most police departments are happy to send a representative to meet with your class during activities such as this. If your city has no bicycling ordinances in force, then get in touch with the Montana Highway Patrol for information on State bicycling statutes.

Lesson #10

Driveways

Introduction

Statistically, the most hazardous traffic situation your students face involves cars and bicycles leaving and entering the roadway via commercial and residential driveways. And, perhaps surprisingly, residential driveways are the scene of most car/bike accidents involving elementary school children.

The nine or ten-year-old bicyclist does most of his riding on residential streets close to home, and the more time one spends in a specific environment, the greater the odds that he will experience an accident in that environment. Also, the very fact that most residential streets are quiet creates a problem in that both drivers and bicyclists are normally relaxed in such an atmosphere. The lack of heavy traffic causes one to drop his guard, to become less alert to hazardous situations and even impending accidents. Finally, parked vehicles and landscaping often hamper, or block completely, one's vision.

The hazards of parked vehicles, landscaping and other visual obstructions are also a factor in the use of commercial driveways. Commercial driveways can also be hazardous due to one crucial and immeasurable factor: The driver's or the bicyclist's state of mind at a given moment. Heavy traffic often creates frustration which leads one to take chances, to be a bit reckless in a desperate attempt to get home, to make an appointment, to reach the store before closing time.

Finally, all of these driveway hazards become even more dangerous to the wrong way rider. Drivers are trained to look at certain very specific places for other traffic. If the bicyclist wishes to be seen—and not hit—he must ride with normal traffic flow, he must be in one of the various places where a driver expects to encounter other traffic.

Lesson #11 consists of an Audio-Visual program, which gives the student a view of driveway hazards from several different perspectives. The intent here is to increase the bicyclist's defensive riding awareness by dramatizing a variety of dangerous situations from the point of view of both bicyclist and driver.

Activities

1. A.V. Packet Ten

A.V. Packet Ten illustrates several different driveway situations from the point of view of both motorist and bicyclist. Using this approach, the student can appreciate the difficulties faced by drivers who are confronted with traffic, visual obstructions and frustration. Beyond emphasizing caution to the student, we want him to appreciate that even careful, concerned drivers can pose a threat to the bicyclist through adverse circumstances.

2. Driveway Diagram

Have the student diagram their own driveways. Be sure they include all landscaping on their lot, as well as their neighbor's lot. What about vehicles that are parked close to their driveway for long periods of time? How busy is their street? If any student can't remember these details, assign the diagram as homework.

If time allows, ask the student to diagram another intersection he frequently encounters. Then, at the completion of the Lesson, the class can share their work and come away with a more thorough knowledge of their cycling environment.

Diagram proper right and left hand turns out of and into the driveway. Scan, signal, proceed with caution!

Lesson #11

Residential Intersections

Introduction

Now that your students have been instructed in proper emergency maneuvers and frequently encountered traffic situations, it's time to take them out on the street to study live traffic. In this way, they can more effectively understand how traffic works, and so learn to ride defensively and avoid, or neutralize situations which might otherwise demand emergency measures. The Activities in the Lesson involve both observation of traffic through a selected intersection, and individual practice riding through the intersection, making a variety of turns.

Survey the school neighborhood for a suitable intersection in a nearby residential neighborhood. This should be an intersection with very light traffic. Your Activities will be most effective if one street is controlled by a *Stop* or *Yield* sign. You may have to search a bit, since controlled intersections are often fairly busy. That's why they're controlled. Watch the intersection at the time of day you plan to use it, since traffic volume often changes from hour to hour.

Once you've settled on a likely intersection, make sure you can get to it over a good route, a route that isn't heavily traveled by cars, or made hazardous by bad streets or construction. If you have any questions about setting a route, look ahead to Lesson #13, Route Selection.

If you can't isolate an intersection that meets the above standards, consider model traffic signs (*Stop, Yield, One Way*) for use in your riding Activities. Then, use an uncontrolled intersection. There are plenty of these that are slow and safe to get to.

Here are some tips for organizing the trip after you've selected a route:

- Most school districts require written parental consent before taking students off of school property. There's certainly nothing wrong with this, and we leave it to the discretion of individual teachers and school administrations. However, remember that Lesson Fifteen also involves a field trip. If you send home a consent form for this Lesson, save yourself some work later and include both lessons.
- Mark the route on a map and file it with the school office and Police Department. If you've properly selected your route, you shouldn't need Police supervision, but it's good practice to alert the Police in advance to your activity to establish extra patrol in the area.
- Don't try to make the trip with more than eight students at a time. The effectiveness of the trips and your ability to safely supervise the group diminishes quite sharply with more than eight students. Most schools keep a volunteer roster. Get as many adults to assist you as practicable.

Activities

1. Intersection Study

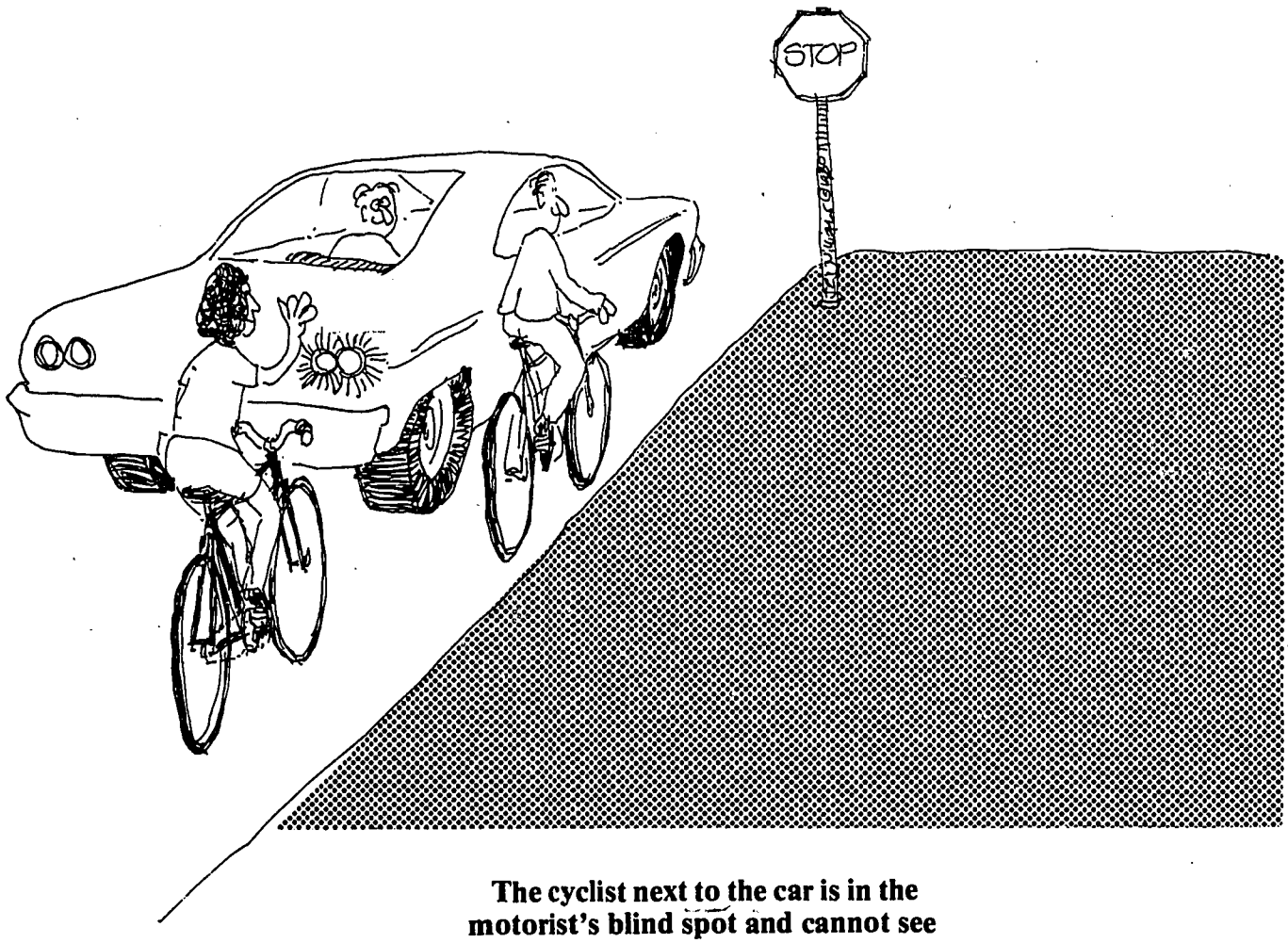
After you've filed your route with the school office and Police Department, lead the group on a ride to your selected intersection. This is the first time you've taken your student bicyclists out into the world, so get off to a good, firm start. They'll want to show you how "good" they are. Don't be surprised when this happens, and exert control.

Once you get to the intersection, park the bikes and gather the students on a corner. Watch the cars. What do they do? Where do they go? What factors enable the bicyclist to predict what the drivers around him will do?

2. Group Discussion

Discuss the group's observations from Activity One with these points in mind:

- Where is the best place for the bicyclist to position himself relative to a car so that he can avoid being cut off if the driver turns right? (See Figure 3.) If the rider is directly alongside the car, he's in the driver's blind spot, and he can't see the turn signals. However, by stopping at the rear of the car, the bicyclist can *see and be seen.* He's probably in view of the driver in front and behind. He can see all turn signals. And, by following the lead car through the intersection, the bicyclist can see what the driver will do before he has to react. Emphasize that passing in an intersection is *always* a dangerous act, one to be avoided at all times.



The cyclist next to the car is in the motorist's blind spot and cannot see the turn signal.
Figure 3

- What's the best way to make a left turn? Here, there are two alternatives. The bicyclist may make the turn by going from corner to corner, as shown in Figure 4. This is the recommended method if traffic is heavy and the bicyclist is uncertain, or unpracticed in such a situation. In fact, there are times when traffic is so heavy that it's wise for the bicyclist to dismount and move through the intersection as a pedestrian, using crosswalks. Or, the bicyclist can *signal* and move to the left before turning, as shown in Figure 4. This maneuver is very similar to the way drivers use a left turn lane, and is one instance when leaving the far right margin of the road is permitted under traffic law in many places. The keys to using this technique are: *Look behind* (scan) before moving left, and *signal.* Know where other traffic is, and let the traffic know what you intend to do.
- In an unmarked intersection, who goes first? The vehicle on the right proceeds through the intersection first. In this situation, a bicycle has the same rights as any other vehicle on the road. However, many drivers don't recognize this, so your students would be well advised to elect caution over boldness in this case.

3. Practice Riding

One at a time, direct members of the group through the intersection. Supervise them through a variety of maneuvers, such as right turns, all manner of left turns, and going straight. And don't forget: HAND SIGNALS. Make sure every member of the group knows the signals for right turn, left turn and stop, and uses them.

Here's a tip to make this Activity run smoothly. As the instructor, you should be as visible as possible to passing motorists. Nearly all drivers are courteous, and will go out of their way to help if you let them know there's a class in progress.

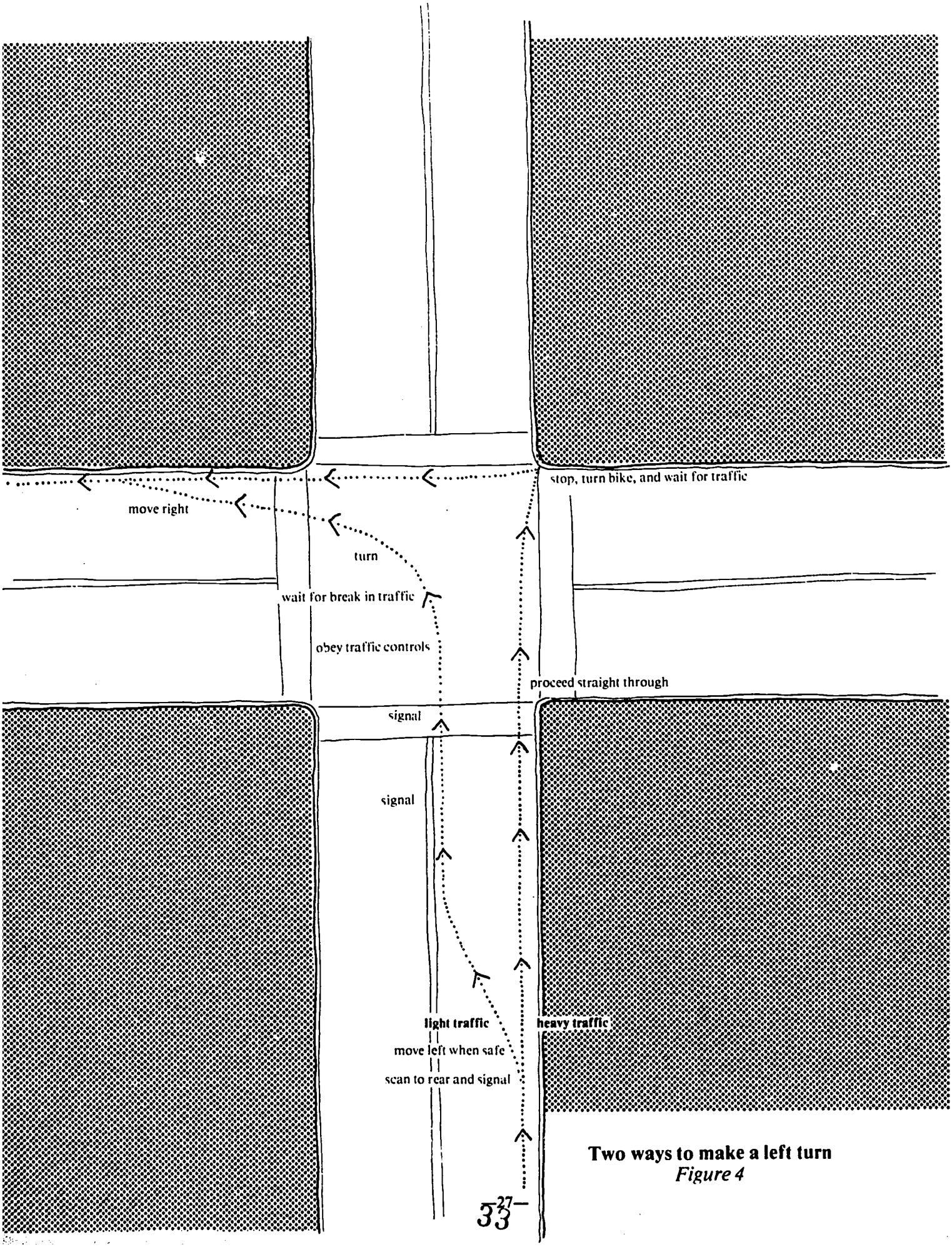
4. Signs

Discuss the ways in which various traffic control devices would alter traffic flow at the intersection. If you brought along model signs, use them here. The most important thing to get across is that *all* traffic control devices and signals apply to bicycles *exactly* as they do to motor vehicles. Yes, even speed limits.

5. Group Discussion

Discuss traffic ordinances as they apply to bicyclists at intersections. These points are relevant:

- Bicycles must remain as far to the right of the road as practicable, except when making a left turn.
- A bike is a vehicle. Therefore, all traffic control devices and regulations apply to bicycles in the same way that they apply to cars.
- When two or more vehicles meet at an uncontrolled intersection, the vehicle on the right has the right-of-way to enter the intersection first. However, bicyclists should use extra care when asserting this right.



Two ways to make a left turn
Figure 4

Lesson #12
High Traffic Intersections

Introduction

After having a guided experience with live traffic, the student is ready to enlarge his understanding of how traffic works. The members of your class are old enough that they will soon be venturing into heavier and heavier traffic. The audio-visual material in this Lesson, coupled with the field trip in Lesson #11, will give your students a good idea of the various high-traffic situations which await them, and how to deal with them.

Activities

1. A.V. Packet 12

Obviously, a field trip to a heavily traveled intersection is much too complicated and dangerous for your class to undertake. But the students' observations during Lesson #11 will enhance the effectiveness of A.V. Packet 12.

A.V. Packet 12 instructs the bicyclist in the differences between high and low traffic intersections. Once this distinction is made, the program illustrates the riding difficulties and accidents in which the bicyclist can become involved at busy intersections, as well as how to deal with those problems.

2. Diagram

Have the students diagram in their Journals the proper positioning of the bicycle in various stages of intersection use, as shown in Figure 4. These diagrams should take into account proper approach, lane usage and position relative to other traffic.

The Activity supports the skills taught in Lesson #11, and tests the students' retention of those skills.

3. List of Specific Accidents

Have the students list the specific accident types, and the riding behavior associated with them. Specifically, here's what you should look for:

- **Turning Motor Vehicles**
  a. The right-turning motor vehicle cuts off the bicyclist trying to ride straight through the intersection. This is caused by several factors. Perhaps the car overtook the bike and cut in front of it. Or, the bicyclist may have tried to sneak by the car. Perhaps the motorist didn't signal. In any event, the accident can be avoided if the bicyclist scans carefully, and positions himself behind, rather than beside, cars in intersections.
  b. The left-turning motorist in the opposite lane of traffic turns in front of the bicyclist who is going straight through the intersection. This accident is often caused by a motorist who misjudges the bicyclist's speed, or who thinks the bicyclist must yield. The bicyclist can avoid this kind of accident only through careful scanning and attention.
- **Violation of Traffic Signals**
  Any kind of accident may result when either the motorist or bicyclist disobeys a traffic signal, such as a *Stop* sign, red light, or *One Way* sign. The bicyclist can avoid these kinds of accidents by obeying the signs and signals. He can avoid motorist-caused accidents in two ways. First, always ride in the proper place. This increases the odds that the violating motorist will see the bike before it's too late. Also, watch other traffic very closely in intersections. Know what other vehicles *should* be doing, so that you can recognize a bad situation in time to respond.
- **Lane Change Accidents**
  Of concern here is the accident in which a vehicle overtakes the bicyclist who is moving from the right margin of the road toward the center to turn left, or change lanes for some other reason, such as leaving a right turn lane. The cause here is usually the cyclist's failure to *scan and signal before moving left.*
- **Turning Bicycles**
  a. One accident of this kind involves the bicyclist who turns left from the far right side of the road, passing across one or more lanes of traffic approaching from the rear. This accident can be avoided in several ways. The cyclist can move left before the intersection (after scanning and signaling), and make the turn from near the center of the road. Or, the cyclist can square the corner by crossing to the far side of the intersection and merging with traffic moving in the direction he wishes to turn. Both of these options are shown in Figure Four.
  b. One other kind of accident results from the turning bicycle. Here, the bicyclist may be turning in either direction, and finds himself going head-on into traffic. This results from cyclist error. Either the bicyclist is riding on the wrong side of the road and turns into the wrong lane of traffic; or, the cyclist turns the wrong direction onto a one-way street. This kind of accident can be avoided by Riding on the Right and obeying traffic control devices.

Lesson #13

Route Selection

Introduction

One fundamental way for the bicyclist to avoid hazards is to be familiar with the place he's riding to, and the route he'll take to get there. Taking a regular, planned route can help neutralize those hazards which cannot be avoided, since the rider deals with them on a routine, rather than a surprise basis.

What are the criteria for a safe route?

- **Where are you? Where do you want to go?** These questions appear almost too simple to require asking, yet they are basic to picking a route, so stop a moment and consider them.

- **Traffic.** Try to select streets where the traffic volume is at a level which doesn't frighten you or strain your confidence and skill. Naturally, this point is a matter of judgment, and will be resolved differently by different cyclists. Still, it is an important consideration, for many riding errors and accidents occur because the cyclist suddenly found himself in traffic so heavy that it rattled his confidence to the point that he abandoned his skills and began to ride erratically. Or, heavy traffic caused him to devote so much attention to his own behavior that he ignored what was happening around him.

  Unfortunately, it's nearly impossible to avoid all heavily traveled streets. The fact that you're riding a bicycle doesn't mean that you won't want to go to many of the same places that people get to in cars. Therefore, you're practically destined to set down your route through some traffic. Still, if you've planned ahead, then you'll have some idea of the tactics you might need to minimize the high-traffic.

- **Street Condition.** Some streets are rougher than others, and nobody likes to ride on a "washboard" surface. On occasion, the rider won't know if a street surface is unacceptable until he rides on it. Still, it's a good habit to make mental notes of streets to avoid because they're too rough or dirty. Incidentally, rough and dirty streets often indicate heavy traffic, so if the street [illegible] quiet, yet abnormally r[illegible] ot a bad idea to check the [illegible] many streets that are jammed at 8:00 a.m. are calm at 9:30 a.m.

- **Construction.** Construction projects come and go, and may require a temporary change in an established route. Don't battle bulldozers and backhoes just because they're "there." It's much easier and safer to detour.

- **Traffic Control.** As was noted earlier, "wrong way riding" is a significant cause of car/bike accidents. This includes riding both on the left, and against traffic on a one-way street. A common reason for wrong way riding on one-way streets is that the bicyclist encounters the street unexpectedly and wants to get to something at the other end of it. Then, through either ignorance of alternatives, or laziness, he turns head-on into traffic. Learn where the one-way streets are. They're very relaxing if you ride the right way—and deadly if you don't.

- **The Scenery.** As long as you're planning ahead, try to avoid ugliness. If all other factors are equal, why not take a scenic route rather than a grim one? Since you're collecting the benefits of bicycling, you might as well collect them all.

- **Time.** One of the meanings of "effective cycling" is that it is a kind of riding that meets the needs of bicyclists. Sooner or later, then, your students will start to consider how long it takes them to ride somewhere. It's easy to say to a bicyclist, "Your means of travel takes a bit longer than others, so start earlier." That may be good advice, but it doesn't always help.

Three things are involved when considering how long a route will take:

a. Faster routes usually have heavier traffic.
b. Many "shortcuts" involve illegal and unsafe use of one-way streets and alleys, sidewalks or intersections.
c. Faster routes are more direct, more attractive to motor vehicles, so you may be trading off the quality of your cycling environment for distance saved.

Point *b.* is, of course, unacceptable. But it is the choice often taken by cyclists in a hurry who don't take a moment to consider points *a.* and *c.*—*who don't plan their route ahead.*

Clearly, the selection of a route is a matter of balancing the rider's skill, where he wants to go, and how long he has to get there. Resolution of these factors will be different for different riders. But the important thing is that they are resolved beforehand. That's what Lesson #13 is all about.

Activities

1. Neighborhood Survey

Have the class identify heavy and light trafficked streets in the neighborhood. Identify bad streets, construction areas. Route previous trips that they have taken through the neighborhood, using an overhead map if one is available. What problems were encountered? How would prior routing have eased those problems?

2. Route to School

Using the information gained in Activity One, have each student route a safe and efficient way to school from his house and back. If time allows, share these routes with everyone in the class.

3. Specific Hazard Identification

Have each student list the specific and general hazards he will encounter along his selected school route.

4. Route for Neighborhood Ride

Using all factors—time allowed, road condition and traffic in the neighborhood, scenery—select a route for the class's use in Lesson #15, Tour of the Neighborhood.

Note: To make the selected route an effective teaching tool, you should have an eye toward such elements as traffic control signs and some hazards. In other words, the route should be safe and efficient, yet offer you the opportunity to point out and discuss frequently encountered bicycling phenomena.

Lesson #14

Controlled Environment Scanning

Introduction

Obviously, the eye perceives innumerable images, of which relatively few represent bicycling hazards. Yet any one of those hazards carries the threat of serious injury if the bicyclist does not perceive a given object or situation as a hazard and respond to it. Time is critical. This lesson continues to sharpen the students' perceptual skills, skills that were introduced in Lesson #3.

Lesson Fourteen employs several audio-visual drills to give the students practice in quick, accurate identification of hazards. Each of the activities involves the very brief viewing of a number of slides, with an interval between slides for the students to identify in their journals any hazards they've just seen. Just as all encounters on the road are not hazardous, every slide does not illustrate a hazard. Some slides show objects or situations which pose no threat to a bicyclist. These innocent images must also be identified as such.

As the class proceeds through these activities, you will notice that their perception becomes more keen with practice. Emphasize this point. Help your students teach themselves to see.

Activities

1. Audio-Visual Drill

Using A.V. Packet Fourteen, flash each slide on the screen for one or two seconds. Allow the students time between slides to identify what they've seen. In some way, they should distinguish whether the slides represent a hazard or not. The key which accompanies the slide packet identifies each slide according to whether it illustrates a hazardous or non-hazardous situation. As the class becomes more skilled at making identification, decrease the viewing time.

2. Audio-Visual Variation B

With this drill, have the students view the slides either individually, or in small groups of students. Provide some distraction. Those students who aren't identifying slides at the moment should be very good at this. Have them try to converse with the students who are watching slides. Or, they can just make random noise, anything to distract from the matter at hand.

3. Group Discussion

For a few moments at the end of the period, lead the class in a discussion of their experiences during the other Activities. The central point of this discussion should be the effect of distractions on the student's perception time and accuracy. Emphasize, too, that hazard perception is a skill that can be developed with practice.

There's another important point concerning perception, one involving motorists. Just as the bicyclist must learn to see what goes on around him, a motorist must often learn to see bicyclists. After their experiences in this lesson, your students should readily understand that they simply can't rely on motorists to see them at all times on the road. As bicyclists, they must assume responsibility for their own actions and safety. To depend on motorists seeing and responding to careless riding is to invite disaster.

Lesson #15

Tour of the Neighborhood

Introduction

Lesson #15 gives the instructor a chance to observe his students under actual bicycling conditions. Logistically, the same ground rules apply here as in Lesson #11, the visit to an intersection. Briefly, don't try to take more than eight students at a time. If this presents a problem, again try contacting local bike clubs, PTA groups, or other organizations for volunteer leaders. However, be selective. Don't expose your class to faulty instruction at this late point in the program. If you do use adult leaders, make sure that they're familiar with all phases of the route, including any planned stops.

If you don't feel than any of the parental consent forms used earlier are adequate to this situation, or if you haven't gone this route before and you want to now, by all means send home a consent form with your students. Note, too, that one of the suggested alternates is also a group ride, so you might find it worthwhile to get consent for that ride now.

Remember to file the route with the school office and the Police to allow for extra patrol in the school neighborhood.

Activities

1. Review the Route

Go over the route with each group. Make sure that everyone knows where you're going, and that you aren't going to stand for any flashy riding.

2. Conduct the Ride

Strike out on your tour, taking care that you set a slow enough pace that the group doesn't get strung out.

A word on police escorts: The police may want to escort your groups, or you may desire such an arrangement. That's fine, but keep in mind that we want the class to experience "real" riding conditions. Sometimes a police escort leads the students to believe that the police are doing all the watching, so there's no need for the bicyclist to pay too much attention. This diminishes the value of the Lesson.

3. Discussion of Riding Conditions

Make several planned stops along the route and talk over the conditions you've encountered. For best results, you should plan these stops ahead of time with an eye toward an effective discussion of traffic signs and signals, surface and environmental hazards, traffic flow and selection of the route itself.

This discussion is the heart of Lesson #15, since it gives you a chance to evaluate your students in a "live" situation, and gives your students the opportunity to use the new skills and knowledge they've acquired.

Don't forget to brief any adult leaders on these planned stops.

Suggested Alternates

City Ordinances

Introduction

As has been stated before, our approach to teaching traffic law has been to establish the logic and value of ordinances, rather than simply to "lay down the law." However, this lesson is built around a much more formal sense of the law than earlier lessons have been. While we don't want to alienate young bicyclists, neither do we want them to escape the fact that there are certain standards of behavior which they are expected to meet—both for their own safety, and for the safety of others on the road.

This lesson consists of group discussion of ordinances in general and an analysis of several actual accidents in which failure to follow ordinances contributed to a bad situation.

Activities

1. Group Discussion

Discuss the need for traffic ordinances, emphasizing again the need for predictability of on-road bicycling ordinances. Be sure to check with local authorities for those laws that apply in your city.

Lifetime Bicycling Activity

Introduction

Right now, the students in your class use their bicycles as their main means of transportation. When they think of going somewhere alone or with other kids, chances are they imagine themselves on their bikes. Soon, though, many of them will start longing for the coming days of motorbikes and cars, and their bikes will begin to seem more and more like relics of the days before they "grew up."

Lifetime Bicycling Activity seeks to encourage your students in the fact that bicycling is an activity that can be enjoyed—and provide countless benefits to the rider—for as long as one wishes to remain astride a bike. The heart of the Lesson then, is an A.V. Packet that touches on the many activities one can continue to enjoy on a bicycle.

Here's a chance for you to use your imagination too. Try contacting local bike clubs or bike shops and inquire into the possibilities of getting a serious bicycle commuter or tourist to visit the class. A visit from someone who's bicycled across the continent is a wonderful way to end the course. And there are more of these people around than you might suspect.

Finally, investigate various ways that you might award some sort of patch or certificate to all of the students in the class. Try working on this with bicycle clubs, PTA groups, or even police departments. Above all, we want students to leave this course with the feeling that they've done something important, something that will keep them safe now, and provide a valuable return for years to come.

Activities

1. A.V. Packet Lifetime Bicycling

Show A.V. Packet Lifetime Bicycling, and present any guest you may have invited to the class.

Ride to Local Shopping Center

Introduction

The only difference between this ride and the one in Lesson #15 is that here the destination and route are a bit more sophisticated. Indeed, this is a route the instructor should choose himself.

Select a shopping area in town that you feel is within the riding scope of your class. Obviously, your central consideration here will be traffic, and you must be the final judge of this point. Try to select a destination and route that are taxing, yet not prohibitively dangerous.

Once you've selected a destination, contact the manager of the center, or one of the merchants, so that they can make arrangements to receive your group and discuss any cycling problems, such as traffic and parking, found in the center.

Activities

Review the route, conduct the ride and discuss conditions exactly as was done in Lesson #15.

Skills Review

Introduction

This lesson provides an opportunity for both students and instructor to review the basic riding skills introduced in Lessons 4, 6, & 8. This will be a chance for you to judge your students' progress and retention. Also, the more recent lessons dealing with traffic and hazards may have impressed on some students the need to sharpen riding skills, so that they will in some cases be more receptive to riding instruction now than they were early in the program.

Activity

For specific guidelines, review the Activities in Lessons 4, 6, & 8. Also, before you decide exactly how much time you'll devote to each Activity, you may want to consult any notes you might have from the original lessons. Or, you might try consulting the class and get their opinion on what drills they'd like more practice on. In any case, the final composition of Activities for the Lesson is left to you, and should be based on your judgment of the needs of specific groups of students.

After watching the class during drills, you may feel it's necessary to assign remedial work to some students. Again, this is a matter for your judgment.

MONTANA BICYCLIST TRAINING PROGRAM

CURRICULUM GUIDE

Daily Lesson Plans

Developed by
Roger DiBrito

Lesson #1

BICYCLE SIZING AND EQUIPMENT CHECK

General Objective(s)

At the completion of this lesson the student will be able to:

- identify a properly sized bicycle
- operate essential safety equipment

Specific Objective(s)

The student will be able to:

- demonstrate the common measurements for determining proper bicycle size
- describe the problems associated with an improperly sized bicycle
- list the most important safety equipment items
- describe in his or her own words the function and proper use of each piece of equipment
- discuss the importance of maintaining a safe bicycle

Equipment

- tools—6" crescent (2-3), screwdriver, pliers
- registration forms, pencils, safety check list (bicyclist forms for Lesson #1)
- grease rag

Suggested Activities:

1. Discuss proper adjustment and equipment
2. Have students check a partner's bicycle (with supervision)
3. Distribute registration

Evaluation Criteria:

1. Participation in discussion
2. Journal entries

Lesson #2

TRAFFIC MIX

General Objective(s)

At the completion of this lesson the student will:

- be aware of the space required to operate a bicycle
- demonstrate proficiency while riding in a defined area

Specific Objective(s)

The student will be able to:

- compare the bicycle space in relation to his body space
- ride alone with control
- maneuver in congested bicycle traffic without incident

Equipment

- traffic cones, first aid kit
- large open space
- bicycles

Suggested Activities

1. In a defined area:
   a) walk throughout the "general space" without touching anyone
   b) run the "general space" without touching anyone
   c) walk the bicycle throughout the "general space" without touching anyone or anything
   d) run with the bicycle in the "general space" without touching anyone
   e) ride slowly through the "general space" without touching anyone
   f) ride faster, with control
2. Discuss the "space relationships" with the group

Evaluation Criteria

1. Observations on number of "touch downs"
2. Participation in group discussion

Lesson #3

HAZARD IDENTIFICATION

General Objective(s)

At the completion of this lesson the student will:

- be familiar with facilities, problems and hazards specific to the local bicycling environment

Specific Objective(s)

The student will be able to:

- identify the most immediate hazards
- become familiar with facilities related to parking and roadway use
- describe situations in which drivers, facilities and other bicyclists do not conform to the student's expectations

Equipment

- slide projector
- Lesson # 3 AV Packet

Suggested Activities

1. Review briefly hazard and accident situations
2. View AV Packet #1 on Hazard Identification
3. Review bicycle ordinances to demonstrate how they create predictable behavior for shared road use

Evaluation Criteria

1. Written test (Written tests are included in the MBTP Evaluation Report)
2. Group discussion
3. Journal entries

Lesson #4

STOPPING

General Objective(s)

At the completion of this lesson the student will be able to:

- display proper stopping techniques

Specific Objective(s)

The student will be able to:

- shift his body weight and apply brakes in such a way as to stop the bicycle in the most direct and safe manner
- judge his stopping distance at various speeds
- gain fundamental knowledge of time and space traveled by vehicles

Equipment and Facilities

- cardboard obstacles, eight traffic cones
- one lane 6'' × 100' marked off with masking tape
- one kitchen sponge per student
- demonstration rider

Suggested Activities

1. Demonstration of proper stopping technique as instructor discusses specific body movements
2. Within a defined area each student will ride toward his sponge and practice stopping
3. Groups of three to five will ride abreast across an open area toward the instructor and stop on command
4. Repeat activity above—with a pace bicyclist Student's aids will measure individual stopping distances and record them, along with the corresponding speeds in the cyclists journal
5. Using the 6'' × 100' lane, each student will:
   a) proceed down the lane and stop on an auditory or visual command by instructor
   b) proceed and stop before hitting a sponge dropped in the path of the student's moving bicycle
   c) proceed and stop before striking a cardboard obstacle held in the rider's path by aids positioned along the lane

Evaluation Criteria

1. The ability to demonstrate proper stopping technique
2. The ability to verbalize stopping technique
3. Written test

Lesson #5

REACTION TIME

General Objective(s)

At the completion of this lesson the student will:

- describe the importance of defensive driving
- state the relative stopping distance of vehicles

Specific Objective(s)

The bicyclist will be able to:

- state the stopping distance of an auto at 20 and 40 mph
- state the relative stopping distance between a bicycle and an auto

Equipment

- slide projector
- Lesson #5 AV Packet
- optional (Braxton BART)

Suggested Activities

1. Discussion of stopping experiences in Lesson #4
2. Lesson #5 AV Packet (illustrates stopping distance for different vehicles)
3. Record in journals stopping time and distances at various speeds of vehicles
4. Analyze personal reaction time of students by:
   a) various clapping and palm slapping games
   b) (optional) use of Braxton reaction time bicycle in conjunction with slide identification
5. Discussion of the change in reaction time and control when the rider is carrying objects in one or both hands

Evaluation Criteria

1. Journal Entries
2. Participation in group discussion

Lesson #6

ROCK DODGING

General Objective(s)

At the completion of this lesson the student will:

- know the proper technique for dodging rocks, potholes, etc.
- demonstrate competency in rock dodging

Specific Objective(s)

The student will be able to:

- describe the dodging technique in a step by step manner
- discuss the reasons for using the technique
- dodge 'rocks' in a variety of settings
- dodge rocks in an abrupt manner without significant swerving or falling

Equipment

- kitchen sponges
- 100' lane
- demonstration rider
- traffic cones

Suggested Activities

1. Demonstrate the proper rock-dodging technique
2. Discuss balance as a critical variable
3. Ride at will in an open area dodging sponges or other non-threatening objects
4. Ride in line formation across an open area dodging rocks upon verbal command
5. Ride in a narrow lane and dodge "rocks" without leaving the lane
6. Discuss the hazards on the roads and the proper approach to take to each

Evaluation Criteria

1. Checklist of proper technique: (do's and don't's)

Lesson #7

EMERGENCY TURNS

General Objective(s)

At the completion of this lesson the student will:

- have observed the relationship of emergency turns to a complete system of defensive driving skills

Specific Objective(s)

The student will be able to:

- define the relationship of rock dodging to emergency turns
- identify situations requiring an emergency turn

Equipment

- slide projector
- AV Packet #7 (Emergency Turns)
- film projector and film "It's Your Move"

Suggested Activities

1. View AV Slide Packet (Lesson #7) which illustrates emergency turns and rock dodging
2. Using incidents recorded in the students' journals, discuss situations requiring an emergency turn, or a dodge
3. Discuss the importance of looking ahead and driving defensively as ways of avoiding the need to make emergency turns

Evaluation Criteria

1. Participation in group discussion
2. Evaluation of students' journal (Optional)
3. Written test

Lesson #8

SCANNING TO THE REAR

General Objective(s)

At the completion of this lesson the student will:

- feel comfortable scanning to the rear

Specific Objective(s)

The student will be able to:

- turn his or her head freely without losing control of the bicycle
- identify objects to the rear with competency
- summarize the reasons for proper scanning

Equipment

- display cards
- 100' lane

Suggested Activities

1. Sitting on a stationary bicycle, the student will scan and identify objects to the rear (partner holds bike); switch roles
2. While riding, the student will scan to the rear and identify display cards on a trailing bicycle
   a) increase speed
   b) scanning at will
   c) switch roles
3. Riding in a narrow lane, the student rides as in activity two above, attempting to identify the cards while keeping within the confines of the lane
4. Riding in groups of two to three, the student rides as in activity #3 above, and scans to the rear upon verbal command; the cards can be held by stationary helpers positioned at appropriate intervals

Evaluation

1. Participation in group discussion
2. Checklist of efficient and proper scanning technique

Lesson #9

TRAFFIC FLOW

General Objective(s)

At the completion of this lesson the student will:

- state the proper direction of traffic flow and the importance of standardized traffic movement

Specific Objective(s)

The student will be able to:

- diagram proper traffic flow on paper, including positioning of his bicycle in traffic
- explain proper traffic flow and the importance of riding on the right
- identify critical traffic control signs
- describe the importance of riding a predictable path (straight line)

Equipment

- slide projector
- AV packet #9
- one copy of ordinance per student

Suggested Activities

1. Using AV Packet Lesson 9, discuss:
   a) road width and position on the road
   b) importance of sharing the road with motor vehicles
   c) importance of standardized flow—(Ride to the Right)
2. Using AV Packet Lesson #9, identify the bicyclist out of place, with emphasis on:
   a) decreased reaction time in wrong-way riding
   b) decreased stopping distance
   c) motorist's failure to "perceive" bicyclists riding on the left
3. Review local ordinances pertaining to road position, riding on the right Also review critical traffic flow signs and traffic ordinances in general

Evaluation Criteria

1. Ability to correctly identify and record out of place vehicles shown in slides
2. Written test

Lesson #10

DRIVEWAYS

General Objective(s)

At the completion of this lesson the student will:

- be aware of the hazards associated with driveways

Specific Objective(s)

The student will be able to:

- identify driveways as they appear from the bicyclist's vantage point
- list the hazards and accidents associated with riding past a driveway
- list the hazards and accidents associated with exiting a driveway
- demonstrate proper riding techniques in association with driveways

Equipment

- slide projector
- AV Packet (#1)

Suggested Activities

1. Show Lesson #10 AV Packet (driveways)
2. Diagram own driveway, showing any shrubbery, normal car placement, etc
3. Diagram proper turns out of and into own driveway

Evaluation

1. Completion of the written test
2. Group discussion of hazards
3. Journal entries of driveway

Lesson #11

RESIDENTIAL INTERSECTIONS

General Objective(s)

At the completion of this lesson the student will:

- be familiar with common accidents associated with a residential intersection

Specific Objective(s)

The student will be able to:

- differentiate between controlled and uncontrolled intersections
- list the hazards and accidents associated with residential intersections
- cite local ordinances governing traffic flow through intersections
- demonstrate proper riding technique within a residential intersection

Equipment

- one residential intersection
- adult bicycle tour leaders

Suggested Activities

1. Ride or walk to an intersection near the school and record routine traffic flow
2. Discuss the findings of (1.) above
3. Ride through the intersection individually, as directed by the instructor
4. Discuss the ways in which traffic control signs (two-way & four-way Stops, Yield) affect traffic flow at intersections
5. Discuss traffic ordinances as they relate to traffic movement through an intersection

Evaluation

1. Journal entries
2. Riding technique . . . ability to demonstrate proper riding technique in an intersection

Lesson #12

HIGH TRAFFIC INTERSECTIONS

General Objective(s)

At the completion of this lesson the student will:

- be aware of the special problems and hazards associated with high traffic intersections

Specific Objective(s)

The student will be able to:

- differentiate between a low and high traffic intersection
- list specific problems encountered at high traffic intersections
- describe accidents which may result from high traffic situations, and the defensive driving techniques with which to avoid these accident situations

Equipment

- slide projector
- Lesson #12 AV Packet

Suggested Activities

1. View AV Packet #12 (High Traffic Intersections)
2. Diagram the proper approach, lane usage, and position relative to other traffic for making left and right turns, and going straight through the intersection
3. List specific accident situations often present at high traffic intersection, and the riding behavior necessary to deal safely with these situations

Evaluation Criteria

1. Journal entries
2. Participation in group discussion

Lesson #13

ROUTE SELECTION

General Objective(s)

At the completion of this lesson the student will:

- list criteria for selection of an effective and safe route of travel

Specific Objective(s)

The student will be able to:

- differentiate between lightly and heavily trafficked streets
- recognize a well-maintained roadway
- demonstrate proficiency in diagramming a safe route of travel

Equipment

- neighborhood map

Suggested Activities

1. Have group identify heavily and lightly trafficked streets in the neighborhood (map overhead can be used), identify specific maintenance problems in the neighborhood and route previous trips that they have taken, and discuss alternates.
2. Have each student establish a safe and efficient route to and from school.
3. List the specific and general hazards along this route.
4. Select a route for the neighborhood ride.

Evaluation Criteria

1. Participation in group discussion
2. Journal entries
3. Written test

Lesson #14

CONTROLLED ENVIRONMENT SCANNING

General Objective(s)

At the completion of this lesson the student will:

- have experienced scanning in a controlled environment

Specific Objective(s)

The student will be able to:

- show how long it takes to identify and react to a given cue
- show how distractions lengthen identification and reaction time
- comprehend the steps of identifying, predicting, deciding and executing evasive action to a hazard

Equipment

- slide projector
- Lesson #14 AV Packet

Suggested Activities

1. Students identify objects illuminated on the screen for a brief period of time (using Lesson #14 AV Packet). Time is alloted for writing down the perceived hazard
2. Same as above—interject stress with techniques described in the Instructor Manual
3. Discuss the effects of distractions and stress on scanning ability and increased reaction time

Evaluation Criteria

1. Participation in group discussion
2. Evaluation of student's journal

Lesson #15

TOUR OF THE NEIGHBORHOOD

Objective(s)

At the completion of this lesson the student will:

- demonstrate riding proficiency under supervised conditions in the school neighborhood

Suggested Activities

1. Review the route selected in Lesson #13
2. Conduct ride
3. Discuss hazards and specific riding conditions as they occur

Evaluation Criteria

1. Observation of riding behavior
2. Group discussion.

Equipment

- bicycles
- map of route
- adult bicycle tour leaders

Suggested Alternate

CITY ORDINANCES

Objective(s)

At the completion of this lesson the student will:

- be familiar with city ordinances and state laws

Suggested Activities

1. Discuss the need for traffic ordinances, emphasizing predictability of traffic (see Instructor Manual for suggested optional activities)
2. Review accident reports—discuss what happened. What rules or laws were violated by the motorist and bicyclist? What could the bicyclist have done to avoid this accident?

Evaluation Criteria

1. Group discussion

Equipment

- copies of city ordinances

Suggested Alternate

LIFETIME BICYCLING ACTIVITY

Objective(s)

At the completion of this lesson the student will:

- be aware of the wealth of transportation, conservation, recreation and the health-building benefits of bicycling as a lifetime activity

Suggested Activities

1. View AV packet which covers bicycle recreation, transportation, et al
2. Award patch for course completion (or other appropriate honor recognition)

Evaluation

1. Group discussion

Equipment

- slide projector
- AV Packet on Lifetime Bicycling

Suggested Alternate

RIDE TO LOCAL SHOPPING CENTER

Objective(s)

At the completion of this lesson the student will:

- have demonstrated riding proficiency under supervised conditions in commercial area parking lots

Suggested Activities

1. Review the route to be followed
2. Conduct ride
3. Discuss hazards and specific riding conditions as they occur

Evaluation Criteria

1. Observation of riding behavior
2. Group discussion

Equipment

- bicycles
- map of route (Journal)
- adult bicycle tour leaders

Suggested Alternate

SKILLS REVIEW

Objective(s)

At the completion of this lesson the student will:

- demonstrate competency with the motor skills introduced in Lessons #4, 6 and 8

Suggested Activities

1. Review as needed the following activities
   - sponge rocks for stopping (#4)
   - sponge rocks for dodging (#6)
   - 3' × 100' lane for scanning to the rear (#8)

Evaluation Criteria

1. Compare student's performance with previous lessons

MONTANA BICYCLIST TRAINING PROGRAM

AUDIO-VISUAL SCRIPT

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INTRODUCTION

This audio-visual program was prepared to assist you in the instruction of bicycling and traffic handling skills. For maximum utility we have prepared this packet for a broad range of instructors—from the full time professional teacher, to the volunteer PTA or community group leader. We assume that many who use this aid will have minimal familarity with bicycle accident causation, and the specific skills needed for bicycling proficiency. Accordingly, we wish to offer the tips below in the use of these materials:

• *Essential points are covered first.* Generally, we have presented the most important points early in the lesson. We have used the double asterisk (**) symbol for major topic points. Try to cover each of these. If you have additional time go on to the remaining points. Be careful not to cover too much material at one time. It is better to teach a few things well than many things poorly. You are not expected to cover every point in the packet.

• *Use a positive approach.* Use these slides to *facilitate* discussion. Give an explanation whenever you can, ask students to give examples, and give praise when something is done well. Avoid a rigid "do's and dont's" approach. When there are teaching points that call for discussion you may want to turn the projector off for a time out. This is difficult if not impossible to do if the script text is not read by the instructor before the slides are to be presented.

• *Use a conversational approach.* Young children are far more attentive and responsive to a conversational approach. Avoid reading straight from the text. You may want to help summarize the major issues and points raised by the students and slides.

• *Act as a resource person.* At times, students will raise questions you may not know the answers to. Let the students know you will research the correct answer and report back during the next class. Use the suggested books and resource people for this course.

• *Recognize the student as an expert.* Keep in mind that most of your students have hundreds of hours of riding experience. They often *know* which of their behaviors work for them. Sometimes, however, this knowledge will lead to trouble. For instance the student may have darted out of his driveway 1,000 times successfully, when in actuality this is one of the most dangerous moves. Focus your discussion on why practices must be based on the *unlikely* 2,027th event where a vehicle is present and the motorist cannot react in time. Also relate the broader context of predictability and needs of the other road users.

• *When possible, work in small groups.* If you can find teaching assistants, break the class into smaller groups (4-7 students each) to allow for maximum involvement of each student. You may still use the slides as a major focal point for the collective group discussions, and to keep the discussion of each group well paced. (Caution: Be alert to the flow in each group, and know when it is time to move on.)

• *Use additional training aids when available.* Although the lessons associated with these packets are largely *in-class* teaching activities, a few may be enhanced by additional activities of your choosing. For instance, a stop watch can actually be used for the lesson on stopping distances and time. You may want to have the students demonstrate these activities for maximum participation and retention. Weather permitting, consider moving certain activities outside to the playground

(Caution: Activity organization and discipline are essential in this teaching environment.)

• *Concentrate on major topic point.* The major teaching objective is repeated at the top of each AV lesson. Many students will only retain one or two points out of the entire presentation. Help the student in as many ways as you can to focus on the most important lesson point(s). By doing this, your time spent on each lesson should be rewarding to you and your students.

• *Order of lessons.* The lessons in this AV packet are not numbered consecutively because they coincide with lessons in the MBTP Instructors Manual. Consult your manual for teaching methods pertaining to these lessons.

Lesson Number Three
Hazard Identification

SLIDE PROGRAM

1. Have you ever walked into a room and failed to notice someone who was there? Our minds are able to select what they want to see. It is possible to see something and yet not perceive it in your mind. Scientists who study people call this *selective perception.* This slide illustrates a motorist who *sees* a bicyclist, but fails to *perceive* the bicyclist. The result, for the bicyclist, is that the motorist might drive right into his path and not realize it until too late.

   One reason motorists fail to *perceive* bicyclists is that the bike rider is still a fairly uncommon object on the roadway. We tend to see what we expect to see. Also, if the bicyclist is out of place, not where he/she should be, then the person is not perceived as readily. Drinking, elderly drivers with restricted vision, and distracting stimuli can make this problem worse.

2. These bicyclists are traveling along the same roadway on a rainy day. Which bicyclist is most likely to be seen first by the motorist? *(Yellow contrasts with the surroundings, and will be perceived earlier.)* It is important to wear bright, contrasting clothing to make you more *conspicuous*. This helps draw attention to you. . .thus the motorist who otherwise may have failed to perceive you, recognizes you and can react.

   Scientists point out that we do not have color perceptions (cones) at the edges of our retina. . .thus we are unable to detect color at any angle other than straight on. Keep in mind that if a motorist is not scanning (many do not), they will not detect color in any direction than on an approach in front of you or behind you. Thus, a motorist coming up at an angle will not be helped by the color you wear.

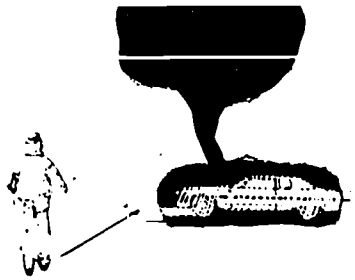
3. At times lighting conditions may make you invisible. This bicyclist in the foreground is brightly lit with a thin shaft of sunlight. Did you focus on this bike rider before recognizing the two others? Remember that many times you will be hidden from the motorist because of shadows and contrasting light. The bicyclist on the left side of the street is not

where the motorist expects him. . .hence he may go unnoticed until too late. Can you think of other conditions that may prevent the motorist from perceiving you until it is too late?

ANSWERS: • drinking drivers, exhaustion, sun glare, snow blindness, stormy weather, motorists with tunnel vision, physical distraction, operational distraction, emotional distraction

TEACHING POINT: *Help the student realize how common distractions are, and why defensive riding is essential*

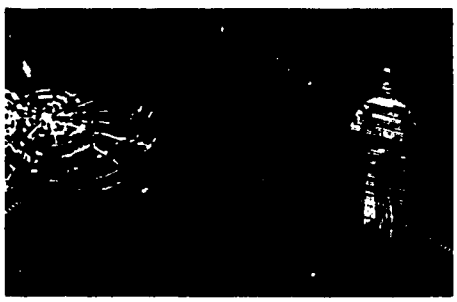
4. In this illustration the bicyclist is only able to see the very tail end of the car. This vision portion of the car is a *cue* that the car poses a hazard . The car is in motion and will move into the roadway blocking the path. An alert bicyclist, by scanning up to 12 second ahead, picks up on these cues and avoids emergency situations. The next few slides present cues. . .see how many you are able to identify. You may not see all of them. Practice does make perfect. . .near the end of the course you should be able to detect many hazards.



NOTE TO INSTRUCTOR: Psychologists have learned that people are able to significantly improve their hazard detection skills with just a few periods of training. We consider this one of the most important exercises of the entire bicyclist training course. We now move into some of the basic perceptual skills required in defensive bicycling.

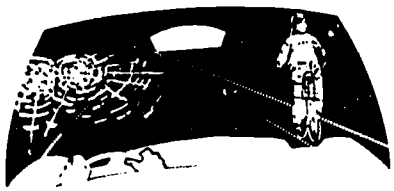
If you have had some close calls with a bicyclist (while driving) be sure to point these out to the class for added emphasis on riding in the correct road position, and riding defensively.

5. What should this bicyclist be alert to?



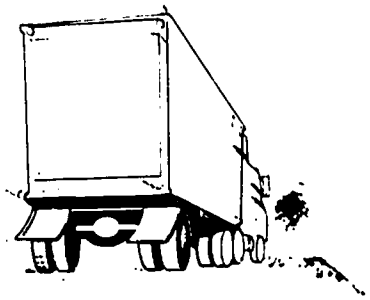
ANSWER: The bicyclist should cue in on the approaching headlights which temporarily blind an overtaking motorist. Most motorists steer toward the shoulder and focus on the white line. . .and thus would not be scanning for a bicyclist. Night riding is especially risky, and should be attempted only with proper lighting equipment and extreme caution.

6. **This is what the motorist sees in the previous slide. If you must ride at night, consider pulling completely off the road and waiting for cars to pass when you find yourself in this situation.**



7. **A passing semi-rig may pose a problem to this bicyclist. List at least two serious factors the bicyclist may have to deal with in this situation.**

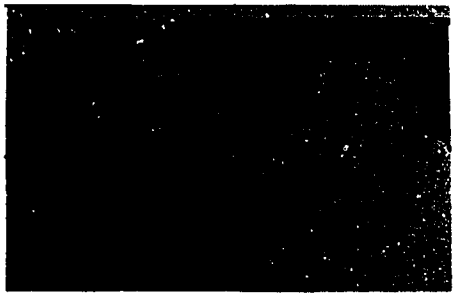
   ANSWER: Noise and wind blast may frighten the bicyclist, or cause momentary loss of control or distraction. A less frequent accident, and more commonly found on rural roads. . .the semi-rig may temporarily cut the force of a side wind. If the bicyclist had been leaning into this sidewind, the sudden elimination may cause the bicyclist to fall into the path of the truck. This can occur on days when the sidewinds are especially strong.



8. **Give two reasons this motorist may not perceive a bicyclist.**

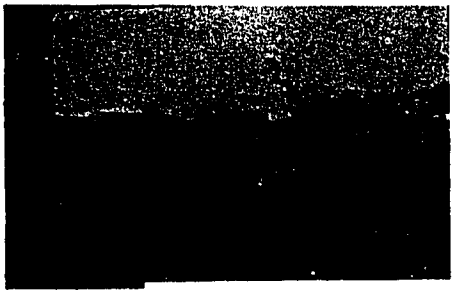
   ANSWER: The bicyclist approaching on the right is riding on the wrong side, and hence is not in a position the motorist expects. A bicyclist approaching on the left is on the sun glare side of the motorist, and may go undetected.

   NOTE TO INSTRUCTOR: Two-way bikeways along a road edge encourage wrong way riding. Alert your students to the risks of using this bikeway. . .in many cases they will not be perceived.



9. **What hazards should this cyclist be alert to?**

   ANSWER: This cyclist is concentrating on missing the debris in the bikeway. By focusing on this the bicyclist may fail to scan an approaching driveway or intersection. Also note the long shadow. Whenever you can see a long shadow, assume that the motorists in the direction your shadow points,are blinded by the sun.



10. **What is likely to happen here?**

    ANSWER: Although the bicyclist is likely to stop, the dog is not. There is a chance this motorist will be surprised by the dog and swerve to miss . . . thus hitting the bicyclist. Note that the sun is on the right side of this motorist, the bike rider is hidden by vegetation and by being in the gully. Also note that the motorist had immediately been concentrating on getting through the RR crossing. For all these reasons the cyclist and dog may have gone undetected until too late.

INSTRUCTOR: Help your students understand this "chain of events."

11. What hazard do you see here?

ANSWER: Blind alley. Approach with caution. A defensive rider would scan behind to make certain there are no overtaking vehicles, and when safe to do so move further out into the lane.

12. Here is the other side of the picture. What might the motorist fail to detect?

ANSWER: By focusing on the lead rider, those following might not be detected until too late. If you see one bicyclist or pedestrian it is always wise to be on the alert for others.

13. List all the hazard cues in this scene.

ANSWER: Dogs, logs blocking view of driver, car might back out, other cars parked diagonally might back out while bicyclist is focusing on dogs, pedestrians exiting between cars, drinking district.

14. What hazards should this bicyclist be alert to?

ANSWER: Sliding on leaves, hitting curbs, not scanning and signalling, drainage grate and debris under the leaves.

15. What special problems must this bicyclist be alert to?

ANSWER: Must cross tracks at 90° angle (otherwise wheel can be locked into track), sun in approaching motorist's eyes, bumpy tracks may momentarily distract a biker from traffic ahead.

16. What hazards are possible here?

ANSWER:Road narrows and the parking lane is no longer available for riding, bicyclist needs to scan and establish eye contact before changing lane position.

17. What hazard cues are present here?

ANSWER: VW is making a "U" turn. Pedestrian's movements are unpredictable. Motorists might be distracted by attractive coed. Parked cars could pull out.

18. What is this bicyclist doing wrong? What other hazards are depicted?

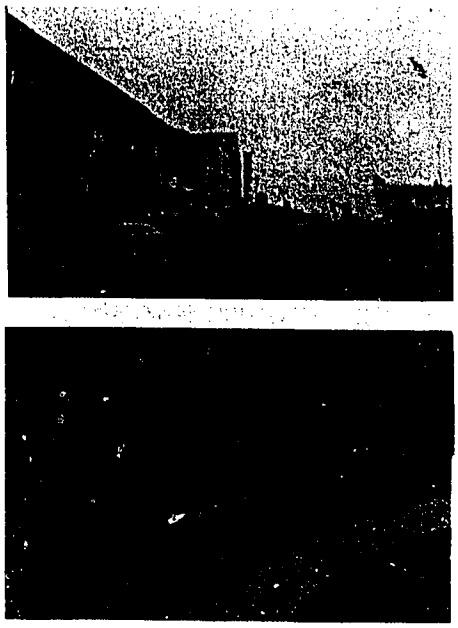
ANSWER: Wrong-way rider (going against the flow of traffic). Cyclist is swinging towel, barefooted. Diagonal parking (motorists unlikely to scan in direction of bicyclist), pedestrians could exit between cars.

19. What should these bicyclists be alert to?

ANSWER: Diagonal parking, pedestrians exiting, bar district.

20. What is happening here?

ANSWER: Wrong-way bicyclist. (Motorist is unlikely to detect this rider while scanning to the left in preparation for turn.)



Lesson Number Five
Reaction Time

PRE-SLIDE PROGRAM ACTIVITIES

A bicyclist needs time to react to hazards. The following activities illustrate how much time it takes to react. Distractions rob us of time to react safely. Use the activities below to demonstrate the importance of scanning and defensive riding.

RULER DROP: Demonstrate reaction time by dropping a 12 or 18 inch ruler above the awaiting hand of a student. This slide is for the benefit of the projectionist. It is not necessary to show this to the students. Note: the student's hand will be extended as in a handshake, and the thumb will meet the fingers in much the same position as in holding a pencil. There should be approximately a one inch space between thumb and fingers. Hold the ruler **directly** ***above the awaiting hand. Note: position the ruler with the number "1" pointing to the floor. Instruct the student to grab the ruler once it is dropped.***

- ***Drop the ruler. (Discuss the number of inches that passed through the students hand before catching it.)***
- ***Repeat the exercise several times. Does the student improve? (There should be improvement . . . reaction time can be sharpened with practice. Point this out to the students as this forms the basis for our future training exercises.)***
- ***If time allows, have students pair up and perform the exercise 5 times. Have students record each try to see improvement. Have students switch roles so that everyone gets a chance to practice.***

RULER DROP WITH DISTRACTIONS: Demonstrate why distractions reduce our reaction time. Have the original student return for a new exercise. This time have several students come forward to create physical, auditory and visual distractions (shouting, tapping subject on his shoulder, jumping around, flashing overhead lights).

- ***Drop the ruler.***
- ***Repeat this exercise several times and compare the results.***

DISCUSSION: ***What happened? It takes longer to react when distracted. It is difficult to focus all of one's energy on one object or event. Ask the students to identify 5-6 common distractions they have when riding a bike (dogs, loose fender, cold, potholes, etc). Ask the students to identify 5-6 common distractions motorists encounter (radio, gas gauge, commercial signs, etc.).***

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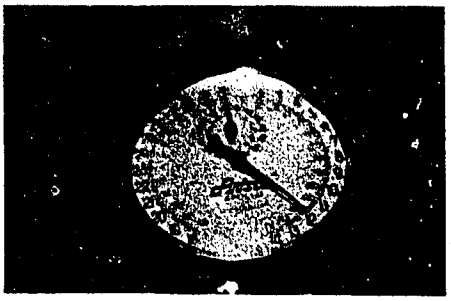
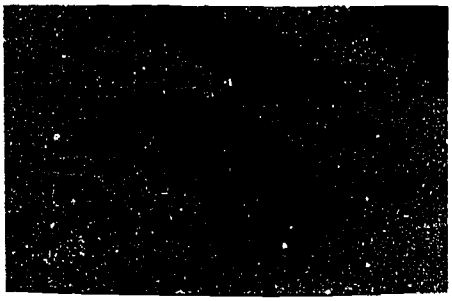
SLIDE PROGRAM



1. **How much time do we need to avoid accidents? Scientists tell us we need to plan ahead 12 seconds. Assuming a speed of 10 mph, how many feet ahead should the bicyclist be alert?** ***(5,280 feet × 10mph × 12 seconds, divided by 60 minutes, divided by 60 seconds = 176 feet).*** **Thus, the bike rider should know what is happening at least 176 feet ahead at all times to ride safely. Furthermore, the rider should be aware of everything happening to both sides and to the rear for a similar distance.**

   ACTIVITY: ***Help the student comprehend short periods of time. Use the schoolroom clock or borrow a stopwatch from the PE teacher. Have one-half of the class observe, and have the second half close their eyes. Tell the class when to begin. Instruct them to raise their hands when they think 12 seconds have gone by. How many students were early? How many on time. . .and how many were late in raising their hands? Suggest a technique for counting time . . . (i.e. "one-Mississippi, two-Mississippi . . .") Repeat the exercise using this method. What are the results?***

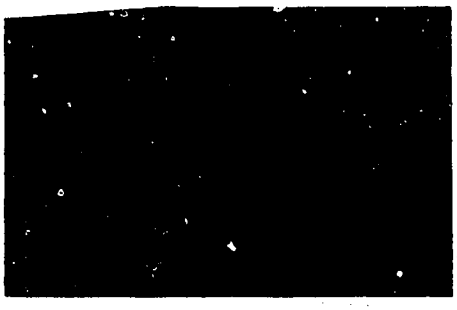
2. **This bicyclist is scanning 176 feet in all directions.** ***(Help your students visualize exactly how far they should be scanning.) (Half a football field, the width of a city block)*** **The bicyclist who rides safely will be leading his vehicle down the roadway by twelve seconds.**



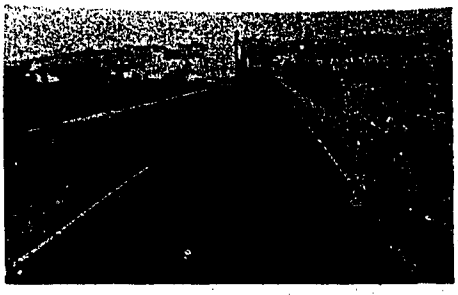
3. **What are the steps in scanning? The human eye has only a three degree cone of sharp central vision in which objects appear in clear detail. Around this central vision is 90 degrees of fuzzy outer (peripheral) vision. While the outer vision is not sharp, it is highly sensitive to motion, to light and darkness, to large and small shapes and sizes. A combination of both sets of seeing equipment, properly used, can cover most riding situations. However, most motorists and bicyclists have not learned how to use this equipment properly.**

By moving our eyes constantly, up and down the roadway, side to side, we are able to check out roadway and from side to side, we are able to check out everything in the traffic scene. When you ride, you should use the narrow three degrees of central vision as a spotlight that constantly sweeps over the riding environment, checking to the right and to the left. ***NOTE: You may want to use a flashlight here to stand in the middle of the room for this . . . most of the time you will be scanning forward, with occasional scans to the left, to the right, and to the rear. Stop for a split-second on significant objects.***

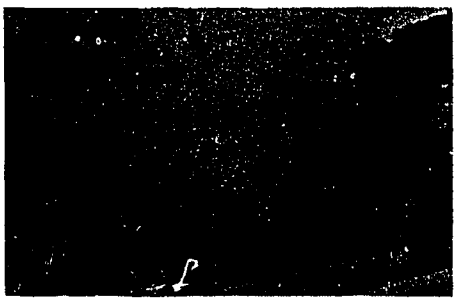
4. **How does scanning work in this setting? This bicyclist is concentrating on the large rocks at the end of his driveway. He knows they may cause him to fall. If he focuses on them for more than a second at a time, he will fail to search for cars to the right or left. Most of his scanning should be to the right and left, with only an occassional glance downward.**



5. **This bicyclist is scanning to the side and rear frequently. He knows that on this bridge he will not have traffic from the right, the left, or head on. However, he must be alert to overtaking traffic, to the high curb that could catch his pedal if he got too close, and to the numerous potholes.** ***NOTE: You may want to use your flashlight to show how the bicyclist would scan in this situation. Your movement should involve a sweeping action about 40 feet forward toward the pavement and curb, with a scan to the side and rear every 3-5 seconds.***



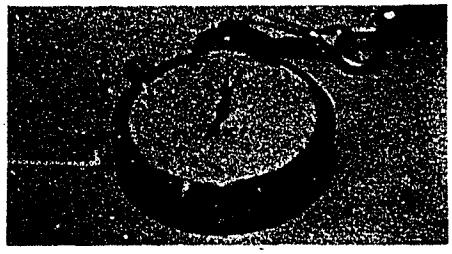
6. **This bicyclist is travelling through a busy intersection. Note how he is focusing on cars entering from the left. He is staring into the sun, and knows that he must be especially alert for any movement from this direction. He is protected from the right, and will probably not glance in this direction, except infrequently, to make sure there are no hazards. He will also scan forward. . .but now he recognizes that much of his attention must be to where traffic is approaching. . .in several seconds all this will change.** ***TEACHING POINT: Help your students realize that scanning requires a constant search. It extends from the front wheel of the bike to a block away. The width of the big picture on a busy street is from the right hand sidewalk to, and including, the oncoming lane of traffic on the other side of the center***



line. On a residential street, it should be from sidewalk to sidewalk. Periodic glances to the rear are also necessary, especially since the bicyclist travels more slowly than motorists.

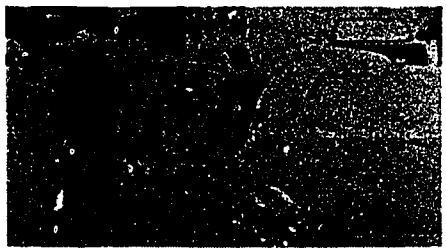
The bicyclist needs to be selective in viewing the big picture. For instance, there are times when there is nothing in the picture that should trigger action. This is the case when the rider scans down a row of parked cars and does not see anyone in any of them. So he disposes of the entire row as being no immediate threat. No car door is going to open, no car is going to move. In the next block a driver in the fifth car gives him a cue to be on the alert. He scans to the rear to make sure it is safe to move out slightly, and continues his forward scan as he approaches, now glancing frequently toward the driver.

7. **Now let us focus on how distractions can hurt us. This stopwatch depicts that a distraction as little as one second, at the wrong time, will cause us to have an accident.**



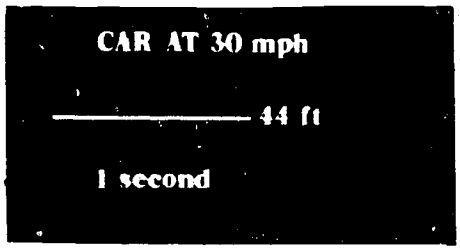
ACTIVITY: Help the student realize just how long one second is. Use the next two slides as follows. Set a book or another object in front of the projector lens. . .then advance to the next slide (#8). Show this slide for just one second by removing the object in front of the projector, counting "One Mississippi," and replacing it.

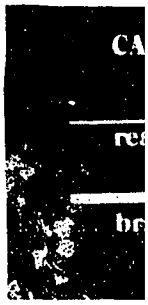
8. *After viewing the slide for just one second, have the students identify the contents of the slide. Then return to the slide and point out, the bicyclist, sun glare to motorist, RR tracks, etc. Emphasize that bicyclists and motorists are constantly asked to react to things they see only for a split second.*



9. *Use the same procedure as above. Return to the slide and discuss the open car door hazard.*

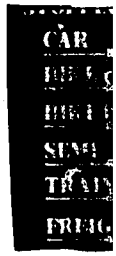
10. **How far do you travel in one second? This slide illustrates how far a car may travel in *one second* when traveling at 30 mph. What is the approximate width of your schoolroom? *(NOTE: Most schoolrooms are 40 feet wide).* How many school rooms would the car travel in one second? Using your classroom as a measure, how many classrooms will this car travel in one second?**



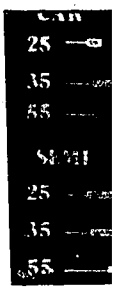


11. **Now let us take what we learned about reaction time and apply it to how long it takes a motorist to stop his car. The distance a vehicle travels while the motorist is reacting is called *reaction distance.* By adding this to the total distance it takes for the brakes to work, we have the total *stopping distance.* This slide shows us how far it takes to stop a car at 30 mph (99 feet). How many classrooms is this *(assuming a 40 ft classroom = 2.5 classrooms)*?**

12. **Do all vehicles stop this quickly? Which of these vehicles requires the most/least space to stop? *NOTE: Have the class pose answers, then go to the next slide for answers.***



13. **When travelling at 15 mph these vehicles require these minimum stopping distances. Note the reaction time *(dotted lines)* are the same. Also note that a bicycle with front and rear brakes will stop in a shorter distance than a bike with a rear brake only. These distances apply only to dry pavement. When the pavement is wet and the rims become wet the *braking* distance is nearly three times as long.**



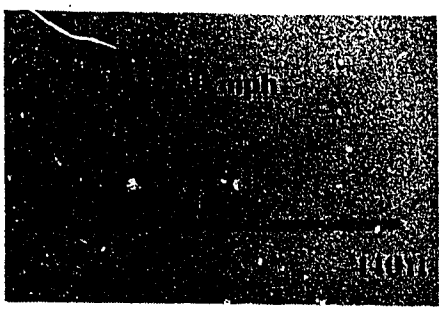
14. **Either now or when you get older you will regularly bicycle and drive on highways where vehicles are going 25, 35 or 55 mph. How do different speeds affect the reaction distance? *(Higher speeds result in increased distance.)* Note that it does not take longer to react, but the vehicle covers more distance at this higher speed. Does it take longer for the vehicle to stop? *(Yes . . . see chart.) (Help the students visualize these distances in terms of their classroom, football field or other familiar distances.)***

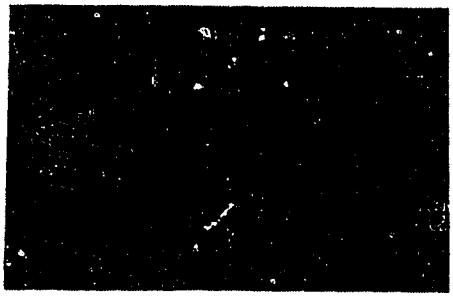
Car @ 25 mph . . . . . 1.7 classrooms (67 feet)
Car @ 35 mph . . . . . 2.93 classrooms (117 feet)
Car @ 55 mph . . . . . 7.28 classrooms (291 feet)

Semi @ 25 mph . . . . 2.70 classrooms (108 feet)
Semi @ 35 mph . . . . 4.98 classrooms (199 feet)
Semi @ 55 mph . . . 12.28 classrooms (451 feet)
or 1.5 football fields

15. **Rain, snow or icy conditions can dramatically affect stopping distance. This slide illustrates the additional distance needed to stop when the road is icy. Assuming that this factor of 10 applies to all vehicles and at all speeds, how far will a semi travel at 55 mph on ice when making a panic stop?** ***You may want to return to the previous slide. (10 × 451 = 4,510 feet or .85 miles)***

16. **Why is defensive riding important? If a motorist is thinking about something other than the bicyclist for just 2-3 seconds, what might happen?** ***(Discuss the distractions illustrated in this slide.)***





ANSWERS:

- *dentist or doctor appointments*
- *trips to the barber shop*
- *getting to the clothing sale before the store closes*
- *take the cat to the vet*
- *hunger*
- *time to cut the grass*
- *will this kid chase the ball into the street?*
- *there is a stop sign coming up*
- *etc.*

Emphasize the importance of remaining alert and assuming the motorist may not always react to the the bicyclist due to distractions.

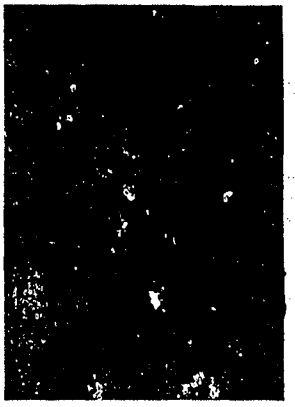
Lesson Number Seven

Emergency Turns

SLIDE PROGRAM

1. **Earlier we learned that almost all accidents can be avoided by staying alert. We use our eyes to lead our bicycle 12 seconds down the road. We scan constantly, and in all directions. In this way we can avoid most emergencies. Despite this constant scanning there may be an occassional motorist or pedestrian that surprises us. You may be able to avoid an accident by suddenly turning aside. In order to do this quickly you need to know how your bike turns.**

   DEMONSTRATION: Take out a pointer, ruler or similar object and balance it upright in the palm of your hand. Explain how the ruler may lean to one side. To keep from losing the ruler you move your hand back underneath the ruler. This is a constant activity. Scientists tell us that the bicyclist is constantly moving his bicycle back underneath his body, just as you are doing with the ruler. Thus, as the bike rider goes down the road, even the most skilled rider will have a slight wobble. We do this without thinking about it.



2. **In the rock dodging exercise you should have turned your bicycle away from the sponge at the last instant. What was happening to your body once you made the quick turn? Your body was immediately thrown away from the direction you turned. . .you were steering the bike away from your body. However, you did not fall over. Why? *An instant later you turned back and picked your body back up).***

   DEMONSTRATION: Explain how rock dodging allows a person to narrowly miss a small object, and yet not swerve more than several inches. The bicyclist instinctively brings his bike back beneath him. . .it requires no thinking. Demonstrate with the ruler. (You may want to hold a finger on top of the ruler as you explain in slow motion.)

3. **When you round a curve what steps do you follow? What is the first step?**

Scientists tell us that we lean first, and turn second. In most cases we do this so quickly they appear simultaneous. Perhaps we even take advantage of the constant wobble (discussed previously under balance) for a planned turn. Note the bicyclist in this slide. He is leaning his right shoulder and much of his body into this right turn. This bike rider is rounding the curve at 30mph. The higher our speed into the curve, the more we must lean in order to keep from falling to the left.

To come out of a turn, you steer a little sharper into the turn, putting your wheels further inside, so you start to fall out of the turn, which lets you straighten up.

4. **Now we will learn how to make a *sharp* turn. We use this skill to avoid an accident. In this slide there are two motorists who may surprise us by making a sudden turn. Assume you are at the point where the photo was taken. Identify the two cars that could collide with you *(The green car in the foreground could suddenly turn right. The white car in the left-hand approach lane could turn left.)* Either turn, if you did not detect it with your scan early enough, could cause you to crash. In both cases you may not have time to stop. What do you do? *(You make a sharp turn to the right . . . this is also called an instant turn, or an emergency turn.)***

ACTIVITY: If the student makes a sudden turn to the right, he will automatically fall to the left. Use the ruler/pointer to illustrate this. Let the object fall to the floor for emphasis.

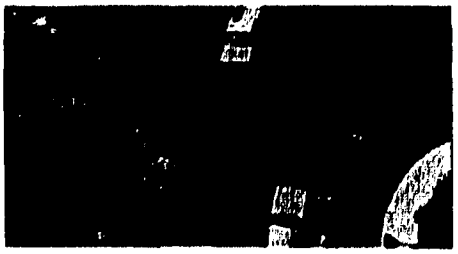
*****Explain the solution.* **To make a sharp turn we must first make a quick turn toward the object we want to miss. This causes our body to fall away from the object. We then swerve sharply away from the object, pick up our body and continue our turn. In this way we can turn within several yards, as opposed to two or three times that distance for a normal turn.**

ACTIVITY: If your class has time, and the PE instructor is willing, have the class practice this exercise at slow speeds, using their practice sponge. THIS SKILL SHOULD BE PRACTICED ONLY IN A SPACE SET ASIDE FOR THIS ACTIVITY. . . Students should not practice this skill in the street at any time.

5. **This bicyclist has been surprised by the truck. A normal turn would not allow him to avoid collision. He is too close to stop. Assume his best escape is to go to the back of the truck** *(the pickup is going forward).* **Which way should he turn first?** *(His wheel should be turned sharply toward the front of the truck).* **An instant later, which way should he turn?** *(Now his body has fallen toward the back of the truck, and he will quickly turn his wheel back toward the rear of the pickup.)*

6. **Keep in mind that being alert will allow you to avoid these emergency turns. You can avoid this car by scanning, and perhaps slowing down to avoid a collision. Ride defensively!**

7. **The bicyclist on the left failed to scan properly. He should have detected the motorist in time to slow down. As a result he is now forced to make an emergency turn. Which way should he turn for the best escape route?** *(By escaping to the right, in front of the truck, he gives himself and the motorist more room to maneuver, and avoids the possibility of oncoming traffic in the left lane.)*



The bicyclist in the right of this slide has also failed to ride defensively. Why? *(This bicyclist is attempting to pass on the approach to an intersection. He was in the* **blind spot** *of the motorist, and is in danger of being cut off by the motorist turning right.)* **What is his escape route if the car suddenly turns to the right?** *(He will be forced to turn to the right . . . and may not have sufficient space to engage an emergency turn. A combination of braking and turning may save him from crashing.)* **Again, ride defensively, and avoid putting yourself in these positions!**

OTHER ACTIVITIES. Time permitting, you may want to show the film, "It's Your Move," by Traveler's Insurance Company.

Lesson Number Nine

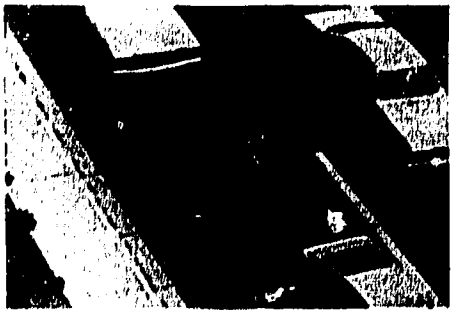
Traffic Flow

SLIDE PROGRAM

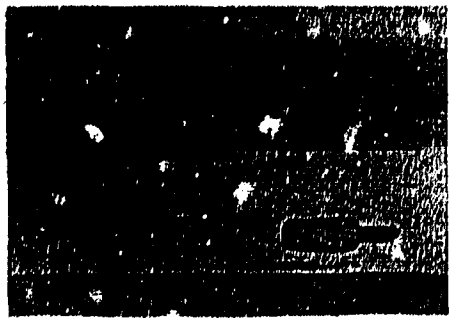
1. **What is traffic? *DEFINITION: "The vehicles, pedestrians, ships or planes moving along a route" . . .Merriam-Webster, 1976.* As depicted by this slide, traffic is nothing more than *people moving!* Any time you are moving, you are traffic. This slide depicts that pedestrians, bicycles, trucks, buses, cars, and even dogs on the sidewalk, are traffic. If a car is parked, if two bicyclists are at the road edge talking, or if the pedestrian is waiting for a bus, they are no longer considered traffic.**

2. **Since, at times, there are many people who want to move through the same area, we find it necessary to adopt rules so that we are not constantly bumping into one another. Perhaps you recall the exercise on the playground where you first walked, then ran, and finally rode your bikes with others in a confined area. To avoid collisions you instinctively began forming circles and patterns. This became even more important as you went faster, and when you used less maneuverable bicycles.**

   Perhaps this helps you understand why fast and heavy cars and trucks need elaborate rules to prevent collisions on the roads.



3. **The bicyclist must follow the same rules as the motorist. It is most safe when we ride in the same direction as other traffic, and follow all the same rules. This bicyclist is crossing a busy intersection. She has fallen in behind a car and will follow all the rules, and be granted all the rights of the driver of any vehicle. In this way she will get across the intersection without risk, and without slowing other traffic.**



4. **By following the rules, our movements become predictable. Note the movement of bike and car traffic in this illustration. Since bikes are fast and maneuverable they go with traffic. List at least three primary traffic rules that help us predict what others will do.**

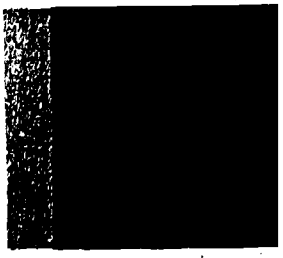
   •ride to the right

- •pass on the left
- •signal your moves
- •stop at controlled intersections
- •at uncontrolled intersections, yield to the vehicle on the right

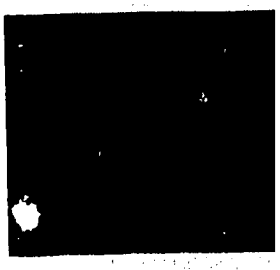
5. This bicyclist is making an effort to be predictable. He has assumed a position on the right side of the road, where he is expected to be. He is signaling his moves. As a result of his effort he is very *conspicuous (observable). This is a signal for a right hand turn.*

6. In which direction is this bicyclist signaling to turn?

7. Note the effort this bicyclist has made to be conspicuous. The bright pennant, the clothing contrast, and the bright saddlebags help the motorist detect this bicyclist.



8. Now let us look at a series of slides to decide which bicyclists are riding in a safe position. Remember, to be safe, the bicyclist must be where the motorist can see him, he must be able to maintain control, travel at a safe speed, and be able to maneuver the same intricate turns that a car makes. Judge the conditions in the next 15 slides, and note if the bicyclist is in a safe position. This bicyclist is riding against the flow of traffic. This is illegal and unsafe.



9. This bike rider is on the right side of the road. However, he is taking up the entire lane in this position. The bicyclist is expected to ride as far to the right as is *practicable, (possible to perform safely).* In this case it is safe for him to ride farther to the right. . .therefore he is not in the correct road position.

10. This bicyclist is riding in a safe position. He is quite conspicuous, and as far to the right as needed for a motorist to pass with assured distance. If he were any closer to the edge he might endanger himself by slipping off the road edge and crashing in the gravel.

11. This bicylist is on the exact edge of the roadway. A skilled bike rider can handle this position with safety, since there is no drop to the shoulder. In some road conditions this may be too far to the right, and would be hazardous, since the bike rider could lose control.

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12. This bicyclist is close to the road edge on an unstable surface. Although he is out of direct traffic, he could lose control and endanger himself, or cause a passing car to swerve. If the bicyclist were two feet to the left it would be safer for both himself and the approaching traffic.

13. The bicyclist in the front is in the better position. The bicyclist in the rear is a bit too close to the concrete edging. It is possible for her pedal to hit the curb and cause her to spill into traffic. In this instance, "as far to the right as *practicable*" allows the bicyclist to ride within the actual traffic lane. The bicyclist who feels uncomfortable in the traffic lane would be safer *walking* along the protected sidewalk.

14. It is illegal and risky to ride a bicycle through a crosswalk. This bicyclist is not following a predictable road channel. The motorist may be confused or surprised by this movement. This often results in injury to the bike rider.

15. These bicyclists are in the parking lane at the extreme left side. They are quite conspicuous and their movement is predictable. If they were farther to the right, they would have to dart in and out between parked cars, creating confusion and risk to themselves and overtaking motorists. It is also legal and proper for the bicyclist to be just to the left of the white line.

16. If these bicyclists are preparing for a left turn they are in the correct position. However, if they intend to go straight they are assuming a position too far to the left, endangering themselves and hindering traffic.

17. Both bicyclists are legal. The cyclist on the left is permitted to ride in this lane, since this is a one-way street and both lanes are open to use. *NOTE: on a one-way street the bicyclist in the left lane should be as far to the left as practicable. In this situation a car is preparing to back out. If the cyclist fails to pick up this cue an accident could take place. Point out the cue (backup lights) to your students.*

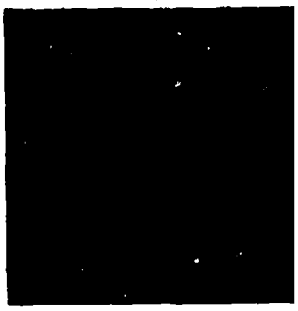
18. This bicyclist is on a rural road with light traffic. This position allows him to move along at a brisk pace in reasonable safety. If he rode closer to the edge it would be possible to slip off the pavement and lose control.

19. **The bike rider in front of the Coke truck is an experienced rider. He now must remain alert and accelerate at the same speed as the traffic in front of him, so as to not hinder the flow of traffic. Once he clears the intersection, he will move to the right edge and allow traffic to continue acceleration. This is a very complex situation, but easily mastered by cyclists 15 years of age or older. This technique is *not recommended* for the average grade school student. Instead, at a high traffic intersection, they should get off and walk bikes as if they were pedestrians. *(NOTE: the bicyclist by the VW is not correct. . . . let students pick this out.)***

20. **It is illegal for anyone to ride on a sidewalk in a commercial or business district. It is also unsafe to enter and exit from a sidewalk while riding a bike. Such entering and exiting confuses the motorist, since this activity is very unpredictable.**

21. **This is a rural roadway with light traffic. The bicyclist is descending a steep hill at high speed. For safety it is reasonable and prudent to command the entire right-hand lane in order to have adequate steering at this fast pace.**

22. **These bicyclists are riding side by side. It is unsafe, and therefore illegal to ride side by side when there is traffic present. Note how this motorist must now wait to pass these bicyclists until there is a break in oncoming traffic. Not only is this unsafe, but it is a hindrance to the motorist, and creates a bad impression of bicyclists.**



Lesson Number Ten
Driveways

SLIDE PROGRAM

1. **Do you believe the greatest number of bike-car collisions take place in this situation?**

2. **Or in this one? Although many students assume that the greatest risk is found on busy streets, the bicyclist is more often hit on a quiet residential street. Residential neighborhoods usually have more uncontrolled intersections, many of which lack good visibility. And most bicycling activity takes place in these neighborhoods. Because the area is quiet, many bike riders are lulled into a false sense of security.**

3. **You may be surprised to learn that one of the most risky of all places is your own driveway. Have you ever left your driveway without checking for traffic?**

   ***NOTE FOR INSTRUCTOR:** Driveway dart-outs are the second greatest cause of injury and death for this age group (running stop signs is Number One). It is one area that we are most likely to gain understanding and compliance. The bike rider has successfully darted out more than 1,000 times. For this reason, a simple explanation that "this is dangerous. . .don't do it" cannot override the experience that it has never happened before.*

4. **At times shrubs and trees restrict either the bicyclist's or the motorist's vision. Motorists generally are not scanning for a bicyclist. However, those that do, still may not have time to detect the erratic bicyclist if vegetation is present.**

5. **Parked cars also restrict vision. This prevents the motorist from seeing the bicyclist until the last instant, which is often too late. Careless placement of cars conceals the bicyclist and other children. Many parents are unaware of this, and continue to park their cars in the most dangerous location.**

6. **At times a neighbor may back out of his/her driveway unaware that a bicyclist may be using the sidewalk or roadway. Other motorists could pull into your path from a commercial driveway or alley.**

7. **Using this slide as an example, list at least 10 ways that you can eliminate driveway car-bike accidents. What can you do by changing your present practices? What instruction can you or your parents give you or your younger brothers/sisters? What can you do to the environment to make accidents less likely?**

BEHAVORIAL CHANGE:

********•always walk your bike to the road**

•always scan in both directions before entering the road.

•do not exit from the sidewalk while riding

•do not ride over curbs

VEHICLE CHANGE:

•Mount a pole and pennant to bike to make it more visible (conspicuous)

ENVIRONMENT:

•cut back shrubs and vegetation that obstruct motorists' view of driveway activity

•ban parking for 40 feet before driveway (right approach is most critical)

•if driveway has a downward slope to the street, relandscape to eliminate this "chute effect."

•remove paved surface and replace with pea gravel or wood chips. This reduces the bicyclist's interest in exiting while on the bike (more friction.)

Although these last two choices are best considered in the original design, we can sometimes make changes.

By developing their own accident countermeasures, students may begin to analyze how to prevent accidents in this and in broader situations. Accident countermeasures can be listed according to 1) Behavior change, 2) Vehicle change, and 3) Changing the environment. The above list of changes has been suggested by safety consultants. Can your class list others?

OTHER ACTIVITIES

See page 23 in the instructor's manual for classroom/homework assignment. Discuss the specific driveway problems your students recall. (During the neighborhood ride students will practice entering and exiting driveways. driveways.

Lesson Number Twelve

High Traffic Intersections

SLIDE PROGRAM

1. **What is an intersection? This slide depicts an intersection which involves a lot of changes. Motorists, bicyclists and pedestrians are changing their direction of travel, slowing down, speeding up, changing lanes. There are often traffic signals to watch. As a result of all this confusion, accidents are likely. This slide program raises points on how we can make these intersections more safe.**

2. **Engineers try to make these intersections more safe. When there is enough land and money they use grade separations. Time separation helps many of us get through without collision. Traffic engineers sometimes time lights to create this time separation. Our most important help in getting through the intersection is our adherance to well understood rules and signals. What are some of these rules?**

   (Stop at stop signs and traffic signals, motorist on left approach yields, yield to emergency vehicles, do not pass in an intersection, signal all turns, and scan before making lane changes, etc.)

   There are a few bicyclists that get through an intersection only because the motorist was flexible and alert. . .and still others that get through only with luck. In the next few slides we will discuss techniques that help us get safely through intersections.

3. **These bicyclists are attempting to cross a 4-lane roadway from a commercial driveway. Is this the way you would cross this road? Is this safe?** ***(This is an example of a very common illegal and unsafe crossing now being made by many fourth graders. In this situation the riders are waiting for a break to dart across traffic. They will then ride through the alley and come out behind cars in the next quadrant. Here they will dart again, ride along the roadway against the flow of traffic, and finally across a third intersection. During our one-hour observation of this intersection [Malfunction Junction] we observed over 20 teams of young bicyclists make this or a similar risky crossing. There are six diagonals in this in-***

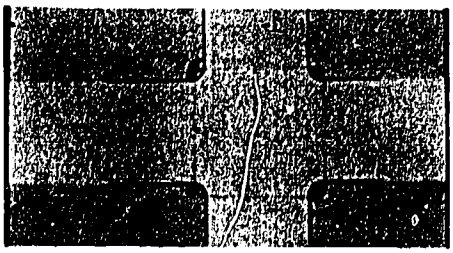
tersection). **This is an unsafe crossing, since motorists are not expecting bicyclists here. These bike riders are taking a great risk and creating a traffic nuisance to motorists fighting to get through this intersection.**

4. **These bicyclists are crossing the roadway 50 yards before the intersection. List several things the motorist is doing at this point that may distract him from recognizing the riders.**

   - **changing lanes**
   - **hurrying to get through the intersection before the light changes (unsafe)**
   - **scanning ahead where he expects cross traffic**
   - **preparing to signal his moves**

5. **Two bicyclists are crossing the roadway. Which procedure is legal? (The bicyclist walking is legal. . . it is *illegal* to ride a bike in a crosswalk.)** ***Walking a bike in the crosswalk is the most safe means of crossing a high-traffic intersection, especially for fourth grade students. In this case the bicyclist assumes the rights and responsibilities of the pedestrian in order to make the crossing.***

6. **This illustration presents two ways to make a left-hand crossing of the intersection. The bicyclist is coming from the left side of the illustration. If the light is red he comes to a complete stop, dismounts and walks in the crosswalk, waits for the light and crosses in the next crosswalk, remounts and continues riding. What other option is illustrated?**



   Students may suggest that they ride on through the green light, and dismount on the far side. This is legal and a viable option. However, one tendency of bike riders doing this is to swerve to the right into the crosswalk. This interferes with pedestrians. . .or, by momentarily turning to the right to get to the crosswalk, the right turning motorist assumes the rider is making a right-hand turn, and then hits the bicyclists when he/she continues through the crosswalk. Point out this risk to the students as one more reason not to ride in the crosswalk.

7. **A second option for making a left-hand turn is to operate as a vehicle. In order to do this what are each of the steps the bicyclist must take?** ***(About 50 yards back you must scan for traffic, signal your move, and then, when it is safe to do so, begin moving to the center of the lane you are in, wait for a break in the approaching traffic, continue your signal, and when it is safe to turn, do so. You do not need to signal while actually turning. You will need both hands on your handlebar to make the turn safely. We do not recommend that bicyclists 15 years old and under make left turns in this manner.***

8. **Now we are ready to master a straight crossing of the intersection. These bicyclists are waiting to cross an intersection controlled by a traffic signal. They have assumed a position to the far left of the parking lane. This leaves space for a right turning vehicle to make a right turn. It also leaves them a direct path ahead so that they do not have to dart from behind the parked cars on the far side of the intersection. When the light changes, they will scan for traffic. Another option would be to move to the crosswalk and walk your bike across.**

9. **This bicyclist has assumed a position directly behind a car. He will ride through this intersection using the entire lane. Once on the far side of the intersection, he will pull to the right edge of the roadway and permit others cars to pass. This technique of "*commanding*" or using the full lane is recommended when the intersection is very busy and complex. The bicyclist has the responsibility to travel through the intersection at a brisk pace, so that he does not slow the traffic.**

10. **This bicyclist has positioned himself to the left side of the curb lane (parking lane). He has also assumed a position back and to the left side of a car that will travel through the intersection (see blue car on left). By doing this the car acts as a *shield*, protecting him from any likely collision. He travels several feet back from the car, and remains in that position until clearing the intersection. This is among the safest position to travel through a busy intersection. What hazard is in front of this bicyclist? How do you recommend he handle this?**

ANSWER: ***The construction walkway is blocking his path. He could dismount and walk the block; or scan, signal, establish eye contact with the motorist behind, and then move into the lane to the left.***

INSTRUCTOR'S NOTE: A bicyclist should never be alongside a car or attempt to pass a car on the right when crossing through an intersection. One of the more common intersection accidents occurs when the motorist turns right in front of the bicyclist. The bike rider that remains back from the car avoids this hazard.

YELLOW PHASE SIGNAL—Bicyclists should never enter an intersection during the yellow phase of a traffic signal. It is illegal. More importantly, the slower speed of the bike rider does not allow him/her to clear the intersection safely. Stress this point.

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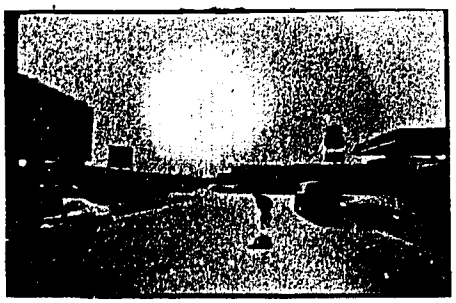
Lesson Number Fourteen

Controlled Environment Scanning

SLIDE PROGRAM

Students will need paper and pencil later in this slide program.

1. **Frequently it will be necessary for you to know exactly what is going on behind you. This cyclist is checking to make certain a car will not be passing as he begins a left hand turn. List other examples of when it is necessary to know what is happening behind you.**

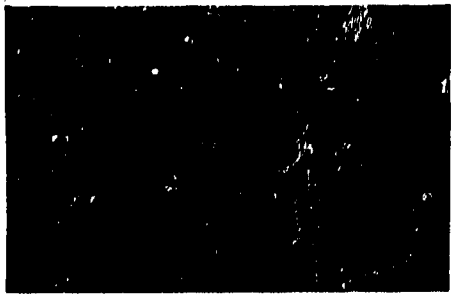


ANSWERS:
- *before you make a left hand turn*
- *changing lanes*
- *to avoid an obstacle*
- *whenever the road narrows*
- *suspicion that motorist is driving erratically (If you suspect this, get off the roadway at once, and then scan)*

NOTE TO INSTRUCTOR: Cyclists **seldom** *scan for traffic to the rear. Many rely on auditory cues . . .which often do not work. Thus we feel it is essential that cyclists become comfortable with the rear scanning technique in order to avoid the serious motorist overtaking injury.*

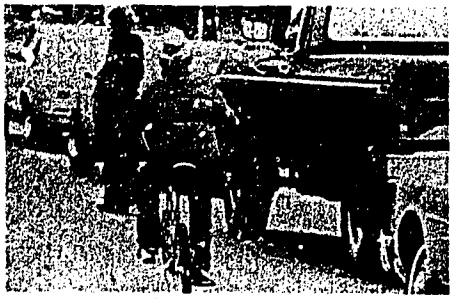
2. **This bicyclist is preparing to turn left. Note that he is scanning to the rear and signaling his move to the motorist behind. In a moment he will scan forward, and in the path of his turn. Once the path is clear he will begin his turn. Why should he not turn until he has scanned forward again?** *(Because a car may be coming from that direction.) NOTE: This bicyclist would have scanned and signalled earlier to assume this lane position . . . thus, a left hand turn requires* **two** *distinct scans, signals, and moves.*

3. **This bicyclist wishes to turn left into his driveway. Note he is scanning. His next move will be to signal and make certain the motorist behind understands his intention. Once the motorist slows or gives him another acknowledgement, he will then move toward the left side of this lane, signal once more and make**



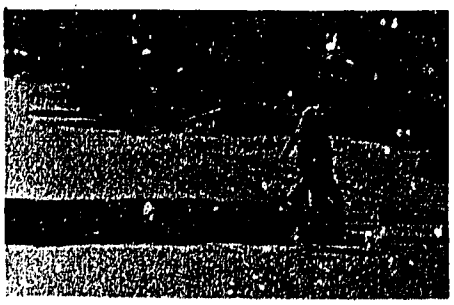
the turn. What is another option this bicyclist has? *(Pause.)* He could exit the road on the right . . . Wait for a break in traffic, and then cross the road as a pedestrian . . . he should NEVER cross the road early during a break in traffic and ride against the flow of traffic *(this is a very typical practice).*

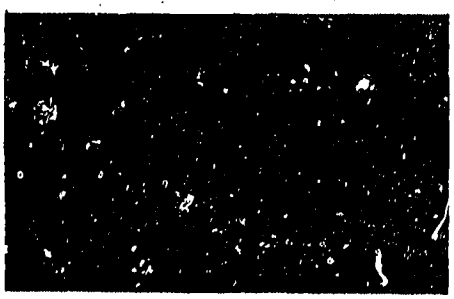
4. Now we are ready to sharpen our skills for detecting hazards. In the exercise that follows, your instructor will flash a slide for only 2 seconds. Scan the photo to find what hazards are present. Some slides will have only one hazard. Others may have 5 or 6. You are not expected to get all the hazards. Write down each of the hazards you recognize. In a few minutes we will go back to each slide and discuss what we saw. Let's try this one together. Look at this slide and point out the hazards you see.



NOTE TO INSTRUCTOR: The following exercise is patterned on a training program for WWII fighter pilots. The pilots were trained to detect a friendly or an enemy plane from a silhouette that was flashed at different points on the screen. At first the pilots were given 2 seconds, but gradually the time was reduced to 1/100th of a second. Most pilots could recognize the plane clearly, while you and I would not have even seen an image. We would like to train each student to scan quickly. If you would like, after 5-6 slides, you may want to shorten the time to one second.

PROCEDURE: Place a book or the Carousel Slide Box in front of the projector and advance to the next slide. Instruct the students to take out their journals and record the hazards they see. Remove the book or box and count "One-Mississippi, Two-Mississippi". . .then replace the box. Allow 30-60 seconds for the students to record their findings. Repeat for ten slides. Return to the first slide in this series and discuss the hazards (listed below).





ANSWERS to #4 above: Pedestrian not looking, second pedestrian might be present, parked cars may have driver opening door or pulling out, intersection ahead.

5. •two kids on one bike, bush blocked view of intersection
6. •open car door, traffic, major intersection ahead
7. •cars passing on left, narrow bridge, high curb, sun glare to right, rough pavement, potholes

8. •road narrows to 2-lane ahead, shaded road ahead, cars in front and behind rider are positioning for lane, car in approaching left lane may be turning across the intersection, intersections on right.

9. •slippery leaves, hidden grate, other debris

10. •extreme traffic pressure, many sign distractions, many commercial entranceways with cars entering and exiting, visual clutter, drivers changing lanes for position, yellow light means motorist may make last minute lane changes.

11. •bicyclist in blind spot of truck, intersection ahead, pedestrian ahead

12. •beware of attacking animals

13. •truck overtaking bicyclist, dense shrubbery on right blocks entranceway to shopping mall (hidden intersection), wet pavement

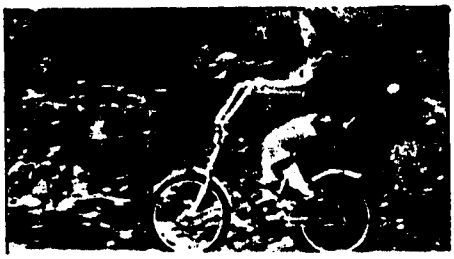
14. •diagonal parking, truck blocks view of intersection, 2 kids are carrying equipment in hands, riding two abreast (illegal if car is approaching, permitted if no traffic present)

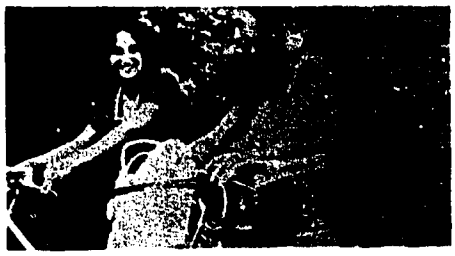
15. •narrow road, gravel (shoulder),gravel on highway, commercial driveways are continuous (car could enter at any point), rough road

NOTE TO INSTRUCTOR: We have attempted to list the major hazards. Your students will, most likely, detect others. As you discuss these hazards, have the students complete their journal listings. This completes the exercise on defensive riding. If you have time, and the students have the interest, we can supply additional slides for further training.

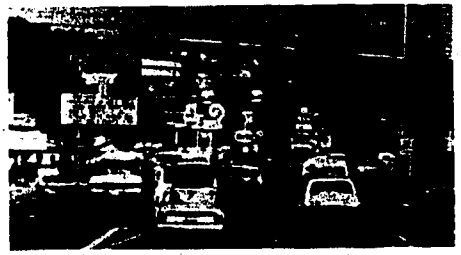
Supplement
Lifetime Bicycling Activity

SLIDE PROGRAM

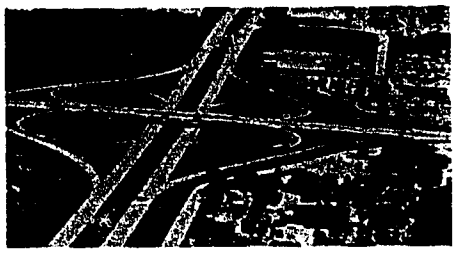




1. During this course we have looked at ways to improve our bicycling. Now we are better able to ride with other traffic, plan our routes, and avoid obstacles. As a result, all of our bicycling can be more fun and safe.
2. When we become adults we may want to continue bicycling. Today many adults use bikes to run errands, visit friends, and travel to and from work. The skills we have learned in this class will enable us to ride even more safely than many adults do today. We have a better idea of the hazards. We have developed skills to avoid accidents. Thus, as we get older we are likely to become even more comfortable on our bikes, and do more things.



3. One reason many motorists are driving less and riding their bikes more is the great cost of operating a car. Scientists tell us that it costs 21¢ a mile to operate a car, or about $2000 per year. A bicycle costs about 1¢ per mile to operate. In future years, the cost for operating a car will be much more.
4. If we can reduce the number of miles we drive our cars, we can limit the number of roads, parking spaces, bridges and other expensive projects. (*From this slide, describe some of the problems our cities have due to the great numbers of roads, parking lots and bridges we build.)*



ANSWERS:
- Roads collect dirt, debris, and require extensive sewers.
- Major roads, such as expressways, divide our cities into areas we cannot get to. Thus, you may have to travel 2 miles to get to a friend's house just 200 yds. away.
- Roads use up land space that could be used for parks.
- Roads reflect heat, and raise the temperature in our inner cities.
- Parking lots take up valuable land and create traffic problems.
- Roads are expensive and raise our taxes. . .thus, as Americans, more of our money goes toward travel than in any other nation in the world.

5. Bicycles can use much simpler systems of getting around. This ferry can carry hundreds of bicyclists and pedestrians, but only four cars. As a result, if many people in an area would use mass transit (buses), walk, or ride bicycles we could get by with fewer bridges. At the same time we could employ more people in jobs such as a ferry boat captain.

6. There are still many things you need to know about bicycling. If you would like to ride greater distances when you get older, you will need to know how to ride your bike on country roads, how to repair your bike, and many other things. First, let's talk about repairing your bike. There are many excellent books you can get that teach you how to make repairs.

7. This student is preparing for a long distance bike trip with his father. He will ride 210 miles in two days (distance from Missoula to Spokane, Washington). Before he starts he wants to make sure his saddle is adjusted properly. He has added a bottle for water, and a rack to carry clothes.

8. This bicyclist is changing the gears on his bike. He knows that the mountains he will go over will require low gears. The books he has read tell him how to make these changes.

9. Once you are in the country there will not be anyone to repair your flat tires. This bicyclist is making a repair along the side of a road in the middle of a rainstorm. If he could not make this repair he would have a long walk.

10. Bicyclists must also plan their routes carefully. These two bike riders are studying a map to make certain they are on the right road. In some states and other countries you may travel, there are choices in roads to make every mile or two. For this reason it is important to learn how to *navigate*. We learn the best places to visit by studying and following your way along a map.

11. Bicycling long distances also requires special equipment. What special equipment does this bicyclist have?

    ANSWER • rear view mirror
    • helmet

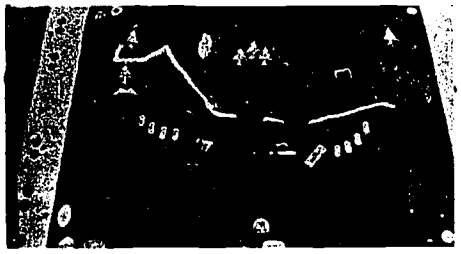
12. These bicyclists are on a cross-country trip. How many miles do you think they can travel in a day? What equipment are they carrying?

ANSWERS:
- 50-60 miles per day is comfortable. Some bicyclists travel 100-200 miles per day. The farthest any person has traveled in one day is 631 miles.
- The orange and blue bags are panniers (pan·yas'). These bags carry food, clothing, tools, and camping equipment. One bicyclist has a front handlebar bag, which carries a camera, raingear, and other equipment which might be needed in a hurry. Also note the safety pennant that helps a car detect a bicyclist on winding or hilly roads.

13. These bicyclists are among 500 Missoula people starting out on the 231 mile Tour of the Swan River Valley (in 2-days). The youngest bicyclist to complete this distance was nine years old.

14. Bicycle racing is very big in Europe and other countries. Which sporting event do you think is the most popular ?
- the Olympics
- the Super Bowl
- the Boston Marathon
- the Tour de France Bicycle Race

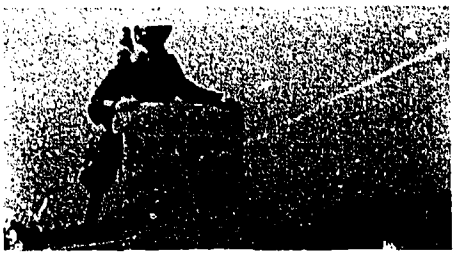
ANSWER: The Tour de France bicycle race lasts 14 days and is attended by more than 8 million people along its course, and by more than 100 million people on TV. This makes it more popular than any American sporting event.



15. Many adult bicyclists are now taking an entire summer to bicycle across the United States. The TransAmerica Bicycle Trail passes through Montana. More than 2,000 people ride this trail each year. The national organization that helps people plan these trips is located in Missoula (Bikecentennial).

16. A cross country trip will allow you to discover oceans, valleys, mountains, plains, and farmland. You can meet many people as you ride. And you will learn more about the history of America.

17. Other bicyclists take off for a trip to Europe, Japan, South America, and other parts of the world. It is an inexpensive way to travel. What country do you think this road sign is in?
ANSWER: Germany



18. This trail is in Switzerland. The bicyclist walking along the trail has been staying in a youth hostel (an inexpensive shelter for hikers and bicyclists). Hostels can be found in most countries in Europe, and in many places in the U.S. Does your city have a youth hostel?
ANSWER: In 1977 a hostel was opened in Missoula. An average of 40 bicyclists and hikers of all ages stay in the hostel each night during the summer months.

19. Another way to travel is to use tents or tarps, and camp along the roads. These bicyclists are traveling through Europe, and have stopped for camp. They are talking about the fun they had visting museums, biking on the roads, and meeting people. They are learning about other people, other nations, and places. Bicycling in this way can be educational.

20. Bicycling also gives you time to be by yourself. To think about the world and how you want to spend your time. In this course we have discovered many new ways to ride. In the future you will make decisions on how much you want the bicycle to be a part of your life. If you choose to use the bike to get around in cities, and for longer travel, we hope you will use the skills you have learned. . .and have fun!

APPENDICES

Appendix A

MONTANA BICYCLIST TRAINING PROGRAM

STUDENT JOURNAL

LESSON TITLE_____ SCHOOL_____ STUDENT NAME _____

INTERSECTION

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Appendix B

INSPECTION LIST

The list and the inspection form were derived from the Bicycle Manufacturers Association of America Model Inspection Form. HSRC modified that form according to recommendations it received from bicycle dealers and mechanics and the North Carolina Bicycle Program.

1. **Size and Fit:** The rider should be able to straddle the frame with both feet flat on the ground. When the rider is seated on the saddle with his heel on the pedal, his leg should be fully extended when the pedal is at its lowest point. (To insure that it won't break off, at least two inches of the seat post should remain within the frame.)
2. **Saddle:** The saddle should be in good condition and tightly secured in a horizontal position.
3. **Frame:** The frame tubing should be straight, and free of dents and kinks.
4. **Front Fork:** Check to make sure it is not bent backward or sideways.
5. **Pedals:** Make sure that they are securely fastened and that the tread is intact.
6. **Handle Bars:** Check to make sure they are symmetrical, in line with the front wheel, and tightened against any horizontal or vertical rotation. The grips should be tight and should not extend above the rider's shoulders.
7. **Front Wheel:**
   - 7A. **Spokes:** Make sure they are all intact and tight.
   - 7B. **Rim:** Make sure it is not dented or twisted.
   - 7C. **Tire (Tread):** Make sure the tire is not bald.
   - 7D. **Tire (Inflation):** With pressure gauge, check tire air pressure to make sure that the tire is inflated according to the specifications stamped on the tire's sidewall. Also, be sure that the tire is properly seated on the rim.
   - 7E. **Alignment in Fork:** Make sure that the wheel is centered securely in the fork and that it can turn freely and evenly.
8. **Rear Wheel:** Repeat the steps for inspecting the front wheel.
9. **Derailleur (for 5 and 10-speed bicycles only):** Be sure that the shifting mechanism accurately transfers the chain from one sprocket to another.
10. **Chain (Tension and Condition):** At its middle, the chain should have ½" of play; the chain should be free of dirt, grit, and should be well lubricated.
11. **Hand Brakes**
    - 11A. **Cable:** Make sure that there are no breaks in the cable and that it effectively engages the brake shoes against the rim. Make sure that both the front and rear brakes operate smoothly.
    - 11B. **Brake Shoes:** Make sure that each pad is at least 3/16th" thick, that the nuts securing them are tight, and that they meet the rim squarely.
12. **Coaster Brakes:** Make sure that there is an adequate back pedalling range of motion (about 20°), and that the coaster brake works effectively.
13. **Reflectors:** Bicycles should have a reflector that is visible from the front and another one that is visible from the rear. Newer models should also have on each wheel reflectors that are visible from the side.
14. **Lights:** For nighttime riding, there should be a headlight in good working order.
15. **Warning device:** There should be a mechanical or electrical warning device that emits a clearly audible sound.

INSPECTION FORM

Bicyclist's Name _____

Address _____

Phone # _____

Size and Fit	☐
Saddle	☐
Frame	☐
Front Fork	☐
Pedals	☐
Handle Bars	☐
Front Wheel	☐
Spokes	☐
Rim	☐
Tire	☐
Tread	☐
Inflation	☐
Alignment in Fork	☐
Rear Wheel	☐
Spokes	☐
Rim	☐
Tire	☐
Tread	☐
Inflation	☐
Alignment in Fork	☐
Derailleur	☐
Chain	☐
Tension	☐
Condition	☐
Hand Brakes	☐
Cable	☐
Brake Shoes	☐
Coaster Brakes	☐
Reflectors	☐
Front	☐
Rear	☐
Wheels	☐
Lights	☐
Warning Device	☐

Remarks: _____

_____

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_____

Inspector's Name: _____

Appendix C

MODEL BICYCLE ORDINANCE

UNIFORM VEHICLE CODE

MODEL STATUTES FOR STATE MOTOR VEHICLE AND TRAFFIC LAWS

Chapter 1—Words and Phrases Defined

§ 1-105—BICYCLE

Every vehicle propelled solely by human power upon which any person may ride, having two tandem wheels, except such vehicles with a seat height of no more than 25 inches from the ground when the seat is adjusted to its highest position, and except scooters and similar devises.

§ 1-114—DRIVER

Every person who drives or is in actual physical control of a vehicle.

§ 1-123.1—HUMAN POWERED VEHICLE

Every vehicle designed to be moved solely by human power.

§ 1-184—VEHICLE

Every device in, upon or by which any person or property is or may be transported or drawn upon a highway, excepting devices used exclusively upon stationary rails or tracks. (A bicycle is a vehicle.)*

Chapter 3—Certificates of Title and Registration of Vehicles

§ 3-102—EXCLUSIONS

No certificate of title need be obtained for: 5. A vehicle moved solely by human or animal power.

Chapter 4—Anti-theft Laws

§ 4-101—EXCEPTIONS FROM PROVISIONS OF THIS CHAPTER

This chapter does not apply to the following unless a title or registration has been issued on such vehicles under this act: 1. A vehicle moved solely by human or animal power.

Chapter 7—Financial Responsibility

§ 7-103—EXEMPT VEHICLES

The following vehicles and their drivers are exempt from this article:

7. A vehicle moved solely by human or animal power.

Chapter 9—Civil Liability

§ 9-401—NEGLIGENCE OF CHILDREN

A violation of any provision of this act by a child under the age of 14 shall not constitute negligence per se although a violation may be considered as evidence of negligence.

Chapter 10 — Accidents and Accident Reports

§ 10-106—IMMEDIATE NOTICE OF ACCIDENT

(a) The driver of a vehicle involved in an accident resulting in injury to or death of any person or in any vehicle becoming so disabled as to prevent its normal and safe operation shall immediately by the quickest means of communication give notice of such accident to the nearest office of a duly authorized police authority. For purposes of this section, a disabled vehicle shall not include a bicycle or any other vehicle moved by human power.

Chapter 11—Rules of the Road

§ 11-313—RESTRICTIONS ON USE OF CONTROLLED-ACCESS ROADWAY

(a) The (State highway commission) by resolution or order entered in its minutes, and local authorities by ordinance, may regulate or prohibit the use of any controlled-access roadway (or highway) within their respective jurisdictions by any class or kind of traffic which is found to be incompatible with the normal and safe movement of traffic.

(b) The (State highway commission) or the local authority adopting any such prohibition shall erect and maintain official traffic-control devices on the controlled-access highway on which such prohibitions are applicable and when in place no person shall disobey the restrictions stated on such devices.

§ 11-504—DRIVERS TO EXERCISE DUE CARE

Notwithstanding other provisions of this chapter or the provisions of any local ordinance, every driver of a vehicle shall exercise due care to avoid colliding with any pedestrian or any person propelling a human powered vehicle and shall give an audible signal when necessary and shall exercise proper precaution upon observing any child or any obviously confused, incapacitated or intoxicated person.

§ 11-509—PEDESTRIANS' RIGHT OF WAY ON SIDEWALKS

The driver of a vehicle crossing a sidewalk shall yield the right of way to any pedestrian and all other traffic on the sidewalk.

§ 11-1103—DRIVING UPON SIDEWALK

No person shall drive any vehicle other than by human power upon a sidewalk or sidewalk area except upon a permanent or duly authorized temporary driveway.

§11-1105—OPENING AND CLOSING VEHICLE DOORS

No person shall open any door on a motor vehicle unless and until it is reasonably safe to do so and can be done without interfering with the movement of other traffic, nor shall any person leave a door open on a side of a vehicle available to moving traffic for a period of time longer than necessary to load or unload passengers.

ARTICLE XII – OPERATION OF BICYCLES AND OTHER HUMAN-POWERED VEHICLES

§ 11-1201 – EFFECT OF REGULATIONS

(a) It is a misdemeanor for any person to do any act forbidden or fail to perform any act required in this article.

(b) The parent of any child and the guardian of any ward shall not authorize or knowingly permit any such child or ward to violate any of the provisions of this act.

§ 11-1202 – TRAFFIC LAWS APPLY TO PERSONS ON BICYCLES AND OTHER HUMAN-POWERED VEHICLES

Every person propelling a vehicle by human power or riding a bicycle shall have all of the rights and all of the duties applicable to the driver of any other vehicle under chapters 10 and 11, except as to special regulations in this article and except as to those provisions which by their nature can have no application.

§ 11-1203 – RIDING ON BICYCLES

No bicycle shall be used to carry more persons at one time than the number for which it is designed or equipped, except that an adult rider may carry a child securely attached to his person in a back pack or sling.

§ 11-1204 – CLINGING TO VEHICLES

(a) No person riding upon any bicycle, coaster, roller skates, sled or toy vehicle shall attach the same or himself to any (streetcar or) vehicle upon a roadway.

(b) This section shall not prohibit attaching a bicycle trailer or bicycle semitrailer to a bicycle if that trailer or semitrailer has been designed for such attachment.

§ 11-1205 – POSITION ON ROADWAY

(a) Any person operating a bicycle or a moped upon a roadway at less than the normal speed of traffic at the time and place and under the conditions then existing shall ride as close as practicable to the right-hand curb or edge of the roadway except under any of the following situation:

(1) When overtaking and passing another bicycle or vehicle proceeding in the same direction.

(2) When preparing for a left turn at an intersection or into a private road or roadway.

(3) When reasonably necessary to avoid conditions including, but not limited to, fixed or moving objects, parked or moving vehicles, bicycles, pedestrians, animals, surface hazards, or substandard width lanes that make it unsafe to continue along the right-hand curb or edge. For purposes of this section, a "substandard width lane" is a lane that is too narrow for a bicycle and vehicle to travel safely side by side within the lane.

(b) Any person operating a bicycle or a moped upon a one-way highway with two or more marked traffic lanes may ride as near the left-hand curb or edge of such roadway as practicable.

§11-1205.1—RIDING TWO ABREAST AND USE OF BICYCLE PATHS

(a) Persons riding bicycles upon a roadway shall not ride more than two abreast except on paths or parts of roadways set aside for the exclusive use of bicycles. Persons riding two abreast shall not impede the normal and reasonable movement of traffic and, on a laned roadway, shall ride within a single lane.

§11-1206—CARRYING ARTICLES

No person operating a bicycle shall carry any package, bundle or article which prevents the use of both hands in the control and operation of the bicycle. A person operating a bicycle shall keep at least one hand on the handlebars at all times.

§ 11-1207—LEFT TURNS

(a) A person riding a bicycle or a moped intending to turn left shall follow a course described in § 11-601 or in subsection (b).

(b) A person riding a bicycle or a moped intending to turn left shall approach the turn as close as practicable to the right curb or edge of the roadway. After proceeding across the intersecting roadway, the turn shall be made as close as practicable to the curb or edge of the roadway on the far side of the intersection. After turning, the bicyclist or moped driver shall comply with any official traffic control device or police officer regulating traffic on the highway along which he intends to proceed.

(c) Notwithstanding the foregoing provisions, the state highway commission and local authorities in their respective jurisdictions may cause official traffic-control devices to be placed and thereby require and direct that a specific course be traveled by turning bicycles or mopeds, and when such devices are so placed, no person shall turn a bicycle or a moped other than as directed and required by such devices.

§ 11-1208—TURN AND STOP SIGNALS

(a) Except as provided in this section, a person riding a bicycle shall comply with § 11-604.

(b) A signal of intention to turn right or left when required shall be given continuously during not less than the last 100 feet traveled by the bicycle before turning, and shall be given while the bicycle is stopped waiting to turn. A signal by hand and arm need not be given continuously if the hand is needed in the control or operation of the bicycle.

§ 11-1209—BICYCLES AND HUMAN-POWERED VEHICLES ON SIDEWALKS

(a) A person propelling a bicycle upon and along a sidewalk, or across a roadway upon and along a crosswalk, shall yield the right of way to any pedestrian and shall give audible signal before overtaking and passing such pedestrian.

(b) A person shall not ride a bicycle upon and along a sidewalk, or across a roadway upon and along a crosswalk, where such use of bicycles is prohibited by official traffic-control devices.

(c) A person propelling a vehicle by human power upon and along a sidewalk, or across a roadway upon and along a crosswalk, shall have all the rights and duties applicable to a pedestrian under the same circumstances.

§ 11-1210—BICYCLE PARKING

(a) A person may park a bicycle on a sidewalk unless prohibited or restricted by an official traffic control device.

(b) A bicycle parked on a sidewalk shall not impede the normal and reasonable movement of pedestrian or other traffic.

(c) A bicycle may be parked on the roadway at any angle to the curb or edge of the roadway at any location where parking is allowed.

(d) A bicycle may be parked on the roadway abreast of another bicycle or bicycles near the side of the roadway at any location where parking is allowed.

(e) A person shall not park a bicycle on a roadway in such a manner as to obstruct the movement of a legally parked motor vehicle.

(f) In all other respects, bicycles parked anywhere on a highway shall conform with the provisions of article 10 regulating the parking of vehicles.

§ 11-1211—BICYCLE RACING

(a) Bicycle racing on the highways is prohibited by § 11-808 except as authorized in this section.

(b) Bicycle racing on a highway shall not be unlawful when a racing event has been approved by state or local authorities on any highway under their respective jurisdictions. Approval of bicycle highway racing events shall be granted only under conditions which assure reasonable safety for all race participants, spectators and other highway users, and which prevent unreasonable interference with traffic flow which would seriously inconvenience other highway users.

(c) By agreement with the approving authority, participants in an approved bicycle highway racing event may be exempted from compliance with any traffic laws otherwise applicable thereto, provided that traffic control is adequate to assure the safety of all highway users.

§ 11-1213—MOPEDS IN BICYCLE LANES

Upon any roadway where motor vehicles are permitted, a person may drive a moped in any lane designed for the use of bicycles.

Chapter 12—Equipment of Vehicles

§ 12-101—SCOPE AND EFFECT OF REGULATIONS

(e) The provisions of this chapter and regulations of the department shall not apply to vehicles moved solely by human power, except as specifically made applicable.

§ 12-201—WHEN LIGHTED LAMPS ARE REQUIRED

Every vehicle upon a highway within this State at any time from a half hour after sunset to a half hour before sunrise and at any other time when, due to insufficient light or unfavorable atmospheric conditions, persons and vehicles on the highway are not clearly discernible at a distance of 1,000 feet ahead shall display lighted head and other lamps and illuminating devices as respectively required for different classes of vehicles, subject to exceptions with respect to parked vehicles, and further that stop lights, turn signals and other signaling devices shall be lighted as prescribed for the use of such devices.

ARTICLE VII—BICYCLES

§ 12-701—APPLICATION OF CHAPTER TO BICYCLES

No provision in this chapter shall apply to bicycles nor to equipment for use on bicycles except as to provisions in this article or unless a provision has been made specifically applicable to bicycles or their equipment.

§ 12-702—HEAD LAMP REQUIRED AT NIGHT

Every bicycle in use at the times described in § 12-201 shall be equipped with a lamp on the front emitting a white light visible from a distance of at least 500 feet to the front.

§ 12-703—REAR REFLECTOR REQUIRED AT ALL TIMES

Every bicycle shall be equipped with a red reflector of a type approved by the department which shall be visible for 600 feet to the rear when directly in front of lawful lower beams of head lamps on a motor vehicle.

§ 12-704—SIDE REFLECTOR OR LIGHT REQUIRED AT NIGHT

Every bicycle when in use at the times described in § 12-201 shall be equipped with reflective material of sufficient size and reflectivity to be visible from both sides for 600 feet when directly in front of lawful lower beams of head lamps on a motor vehicle, or, in lieu of such reflective material, with a lighted lamp visible from both sides from a distance of at least 500 feet.

§ 12-705—ADDITIONAL LIGHTS OR REFLECTORS AUTHORIZED

A bicycle or its rider may be equipped with lights or reflectors in addition to those required by the foregoing sections.

§ 12-706—BRAKE REQUIRED

Every bicycle shall be equipped with a brake or brakes which will enable its driver to stop the bicycle within 25 feet from a speed of 10 miles per hour on dry, level, clean pavement.

§ 12-707—SIRENS AND WHISTLES PROHIBITED

A bicycle shall not be equipped with, nor shall any person use upon a bicycle, any siren or whistle.

§ 12-708—BICYCLE IDENTIFYING NUMBER

A person engaged in the business of selling bicycles at retail shall not sell any bicycle unless the bicycle has an identifying number permanently stamped or cast on its frame.

§ 12-709—INSPECTING BICYCLES

A uniformed police officer may at any time upon reasonable cause to believe that a bicycle is unsafe or not equipped as required by law, or that its equipment is not in proper adjustment or repair, require the person riding the bicycle to stop and submit the bicycle to an inspection and such test with reference thereto as may be appropriate.

Chapter 15—Respective Powers of State and Local Authorities

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§ 15-101—PROVISIONS UNIFORM THROUGHOUT STATE

The provisions of this act shall be applicable and uniform throughout this State and in all political subdivisions and municipalities therein and no local authority shall enact or enforce any ordinance on a matter covered by the provisions of such chapters unless expressly authorized.

§ 15-102—POWERS OF LOCAL AUTHORITIES

(a) The provisions of this act shall not be deemed to prevent local authorities with respect to streets and highways under their jurisdiction and within the reasonable exercise of the police power from:

8. Regulating the operation of bicycles and requiring the registration and inspection of same, including the requirement of registration fee.

MODEL TRAFFIC ORDINANCE

For municipalities to implement or supplement provisions in the State Uniform Vehicle Code

ARTICLE XII – REGULATIONS FOR BICYCLES*

§ 12-1—EFFECT OF REGULATIONS

(a) It is a misdemeanor for any person to do any act forbidden or fail to perform any act required in this article.

(b) The parent of any child and the guardian of any ward shall not authorize or knowingly permit any such child or ward to violate any of the provisions of this ordinance.

(c) These regulations applicable to bicycles shall apply whenever a bicycle is operated upon any highway or upon any path set aside for the exclusive use of bicycles subject to those exceptions stated herein.

§ 12-2—LICENSE REQUIRED

No person who resides within this city shall ride or propel a bicycle on any street or upon any public path set aside for the exclusive use of bicycles unless such bicycle has been licensed and a license plate is attached thereto as provided herein.

§ 12-3—LICENSE APPLICATION

Application for a bicycle license and license plate shall be made upon a form provided by the city and shall be made to the (chief of police). An annual license fee of _____ shall be paid to the city before each license or renewal thereof is granted.

§ 12-4—ISSUANCE OF LICENSE

(a) The (chief of police) upon receiving proper application therefor is authorized to issue a bicycle license which shall be effective until (the next succeeding first day of July).

(b) The (chief of police) shall not issue a license for any bicycle when he knows or has reasonable ground to believe that the applicant is not the owner of or entitled to the possession of such bicycle.

(c) The (chief of police) shall keep a record of the number of each license, the date issued, the name and address of the person to whom issued, and the number on the frame of the bicycle for which issued, and a record of all bicycle license fees collected by him.

§ 12-5—ATTACHMENT OF LICENSE PLATE

(a) The (chief of police) upon issuing a bicycle license shall also issue a license plate bearing the license number assigned to the bicycle, the name of the city, and (the calendar year for which issued) (the expiration date thereof).

(b) The (chief of police) shall cause such license plate to be firmly attached to the rear mudguard or frame of the bicycle for which issued in such position as to be plainly visible from the rear.

(c) No person shall remove a license plate from a bicycle during the period for which issued except upon a transfer of ownership or in the event the bicycle is dismantled and no longer operated upon any street in this city.

§ 12-6—INSPECTION OF BICYCLES

The chief of police, or an officer assigned such responsibility, shall inspect each bicycle before licensing the same and shall refuse a license for any bicycle which he determines is in unsafe mechanical condition.

§ 12-7—RENEWAL OF LICENSE

Upon the expiration of any bicycle license the same may be renewed upon application and payment of the same fee as upon an original application.

§ 12-8—TRANSFER OF OWNERSHIP

Upon the sale or other transfer of a licensed bicycle the licensee shall remove the license plate and shall either surrender the same to the (chief of police) or may upon proper application but without payment of additional fee have said plate assigned to another bicycle owned by the applicant.

§ 12-11—TRAFFIC ORDINANCES APPLY TO PERSONS RIDING BICYCLES

Every person propelling a vehicle by human power or riding a bicycle shall have all of the rights and all the duties applicable to the driver of any other vehicle by this ordinance except as to special regulations in this article and except as to those provisions of this ordinance which by their nature can have no application.

§ 12-14—ATTACHING BICYCLE TO POLES

Any person may park near, and secure a bicycle to, any publicly owned pole or post for a period of not more than twelve consecutive hours, unless an official traffic-control device or any applicable law or ordinance prohibits parking or securing bicycles at that location. No bicycle shall be secured to any tree, fire hydrant, or police or fire call box. No bicycle shall be secured in any manner so as to impede the normal and reasonable movement of pedestrian or other traffic.

§ 12-15—PENALTIES

Every person convicted of a violation of any provision of this article shall be punished by a fine of not more than _____ dollars or by removal and detention of the license plate from such person's bicycle for a period not to exceed _____ days or by impounding of such person's bicycle for a period not to exceed _____ days or by any combination thereof.

Appendix D

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BOOKS

Ballantine, R. **Richards Bicycling Book** New York: Ballantine Books, 1972

Forester, J. **Effective Cycling** Palo Alto, CA: Custom Cycle Fitments, 1978

Cross K.D. **Bicycle Safety Education Facts and Issues** Santa Barbara, CA: Anacapa Sciences, Inc., 1978

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